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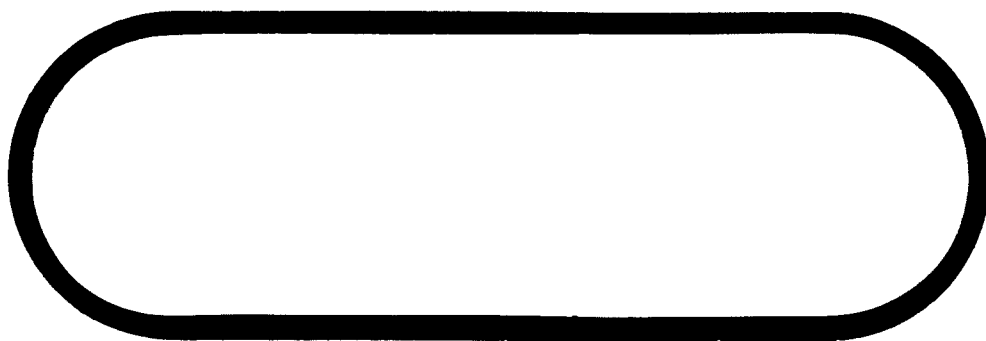
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TEST 3.1.1.1

1. Title

LCF Power System Static Test, DC Loads

2. Objectives

To provide information on the power system operation with resistive loads for comparison with compatibility test results. Compatibility tests are performed by substituting operational equipment for the resistive loads in NRA III-A.

3. Description

- 3.1 Prerequisite: The LCF Power subsystem will have been checked out per D2-7819, Volume II prior to performance of this test. The batteries will be fully charged per D2-7819 paragraph 8.6. Record the battery voltages.
- 3.2 Open all breakers on rack 301.
- 3.3 Connect resistive loads to the power system as shown in Fig. 3.1.1.1-1.
- 3.4 Monitor 400 cycle voltage and phase at U301J14RJ17, U301J15RJ17, and U301J16RJ17.
- 3.5 Monitor current, voltage, power frequency and waveshape at Instrumentation Selector No. 1 (T700), Figure 3.1.1.1-2.
- 3.6 Monitor current voltages, power at U301J3.
- 3.7 Measure voltage at LCF Contactor across batteries.
- 3.8 While monitoring at LCF Contactor for transients, close breakers CB10, CB11, CB12 on LCF Power Rack. Photograph any transients observed.

- 3.9 Photograph ripple at LCF Contactor.
- 3.10 Close breakers CB1 and CB2.
- 3.11 Monitor transients at U301J6P3R5 while closing breakers CB9, CB8, CB7 and CB6, in that order. Photograph transients.
- 3.12 Measure DC voltage at U301J6P3R5 with a differential voltmeter.
Measure AC ripple.
- 3.13 Monitor transients at U301J11P10R9 while closing breakers CB4 and CB5 in that order.
- 3.14 Measure DC voltage at U301J11P10R9 with a differential voltmeter.
Photograph AC ripple.
- 3.15 Photograph AC ripple at U301J6P3R5.
- 3.16 Monitor transients which occur at U301J6P3R6 while opening and closing breaker CB3. Photograph transients if noted.
- 3.17 Repeat measurements of 3.5.
- 3.18 Repeat measurements of 3.6.
- 3.19 Repeat measurements of 3.7.
- 3.20 Monitor transient at U301J6P3R5 while opening and while closing CB2. Leave CB2 closed.
- 3.21 Monitor transient at U301J6P3R5 while opening, then while closing CB1.
Pay particular attention to overshoot.
- 3.22 Measure current at U301J1P1 and at U301J1P3.
- 3.23 Open LCF 60A breaker to MG set while monitoring U307J2P1, U307J2P2, U307J2P3, U307J4P1, U307J4P3, U307J1P1, U307J1P2, U307J1P3, U307J1P4, and output of frequency discriminator (Figure 3.1.1.1-2) with the oscillograph. Also monitor the

following signals with the tape recorder at 60 ips: U348TXV,
U348TY, U307J2P1V100T4, U307J3P2V36T5, U307J4P3V5T6, U301J6P3V36T7,
U301J6P5V5T8, U301J4P9V36T9, U301J4P9V5T10.

3.24 Close 60 ~ primary breaker to MG set while recording signals in
step 3.2.3.

3.25 Disconnect leads to recording system.

3.26 Open 60 ~ primary breaker and repeat measurements per 3.5, 3.6, 3.7,
3.9, 3.12, 3.14, 3.15, 3.22.

3.27 Close primary power breaker.

3.28 Record battery voltages.

4. Equipment in Test

4.1 LCF Power Group 25-24197

4.2 LCF M-G Set 10-20945-1

4.3 LCF Batteries 10-20811-5

4.4 NRA Cables T901 to T910, T721, T709 to T707, T700 to T704.

4.5 LCF Contactor 25-33034-1

4.6 Resistive Loads

5. Test Equipment Required

5.1 NRA Instrumentation System

5.2 Oscilloscope, Tektronix 545A

5.3 Plug-In Unit, Tektronix Type CA

5.4 Frequency Discriminator, Figure 3.1.1.1-2.

5.5 Differential Voltmeter, Fluke 803.

5.6 LCF Instrumentation Assembly

6. Data Requirements

6.1 All tape recorded signals are referenced to 300 mcm ground bus.

Record tape at 60 ips and play back at 7.5 ips.

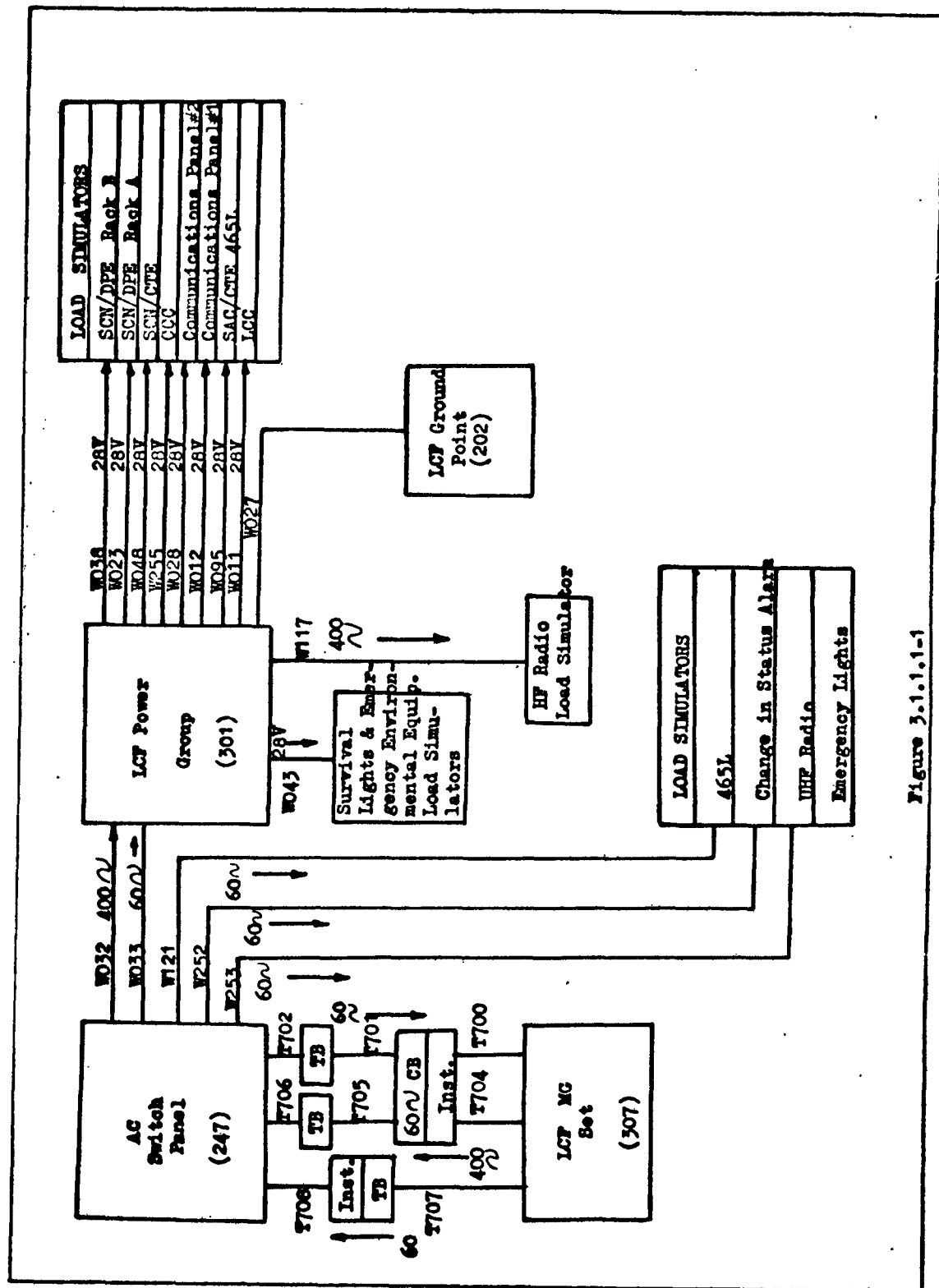


Figure 3.1.1.1-1

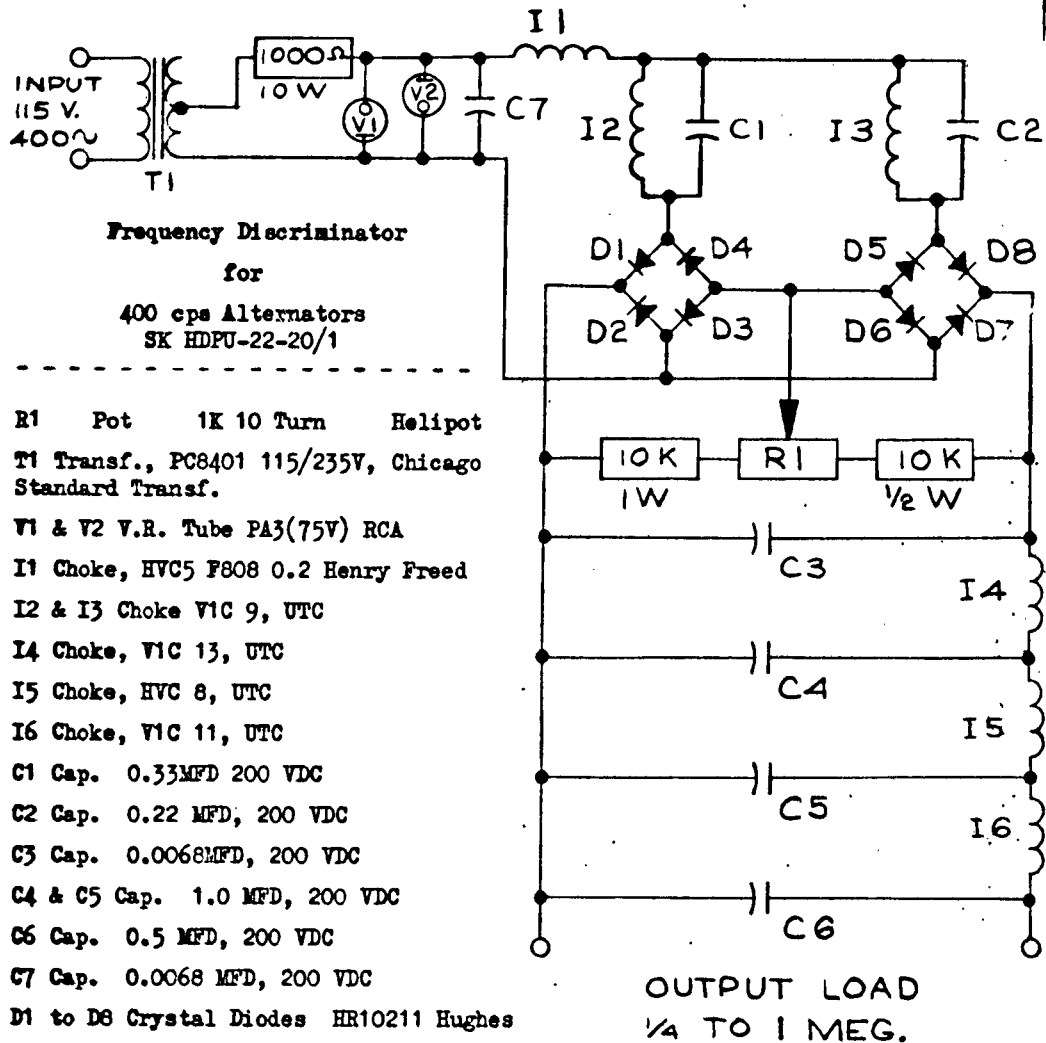
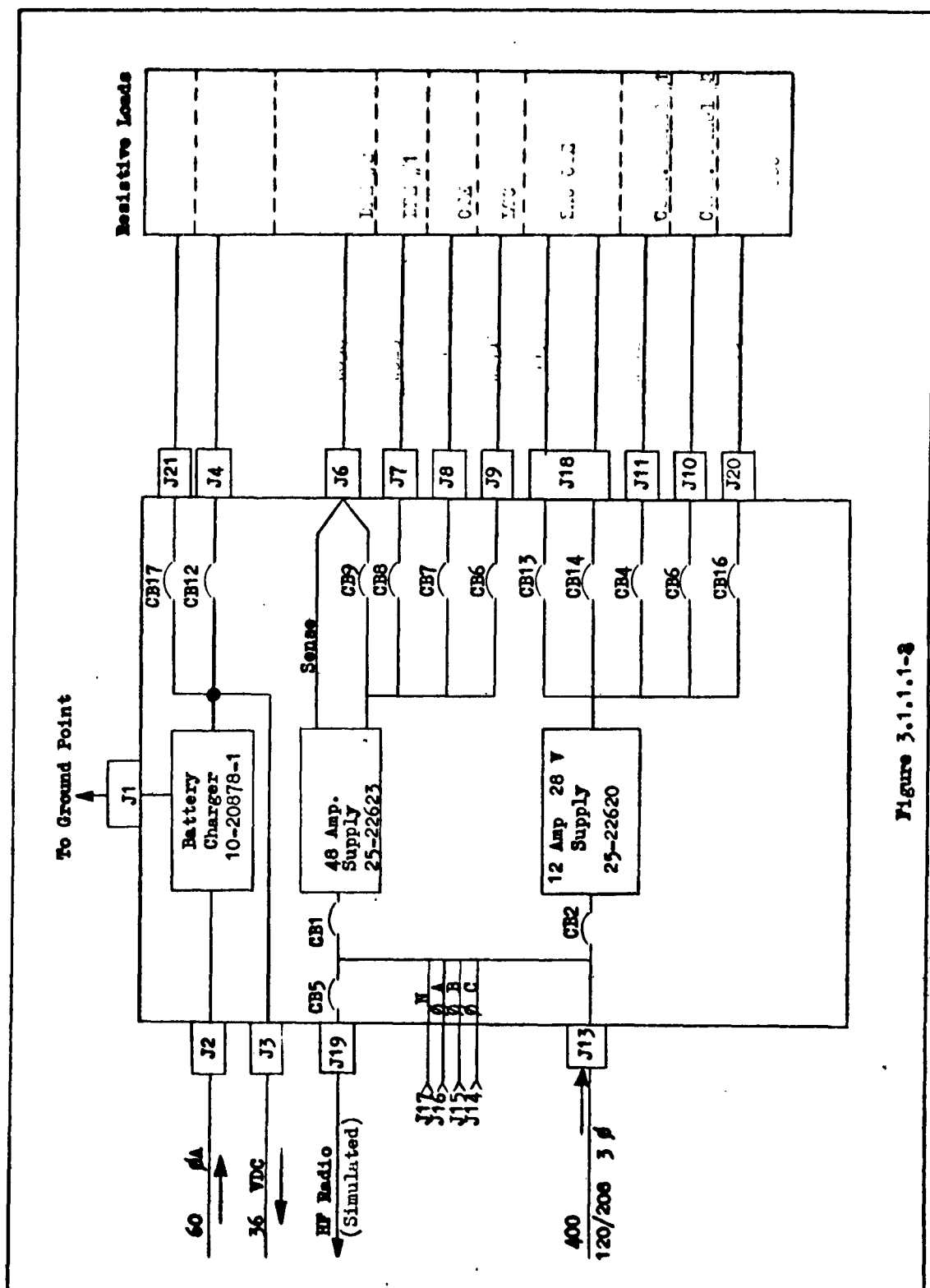
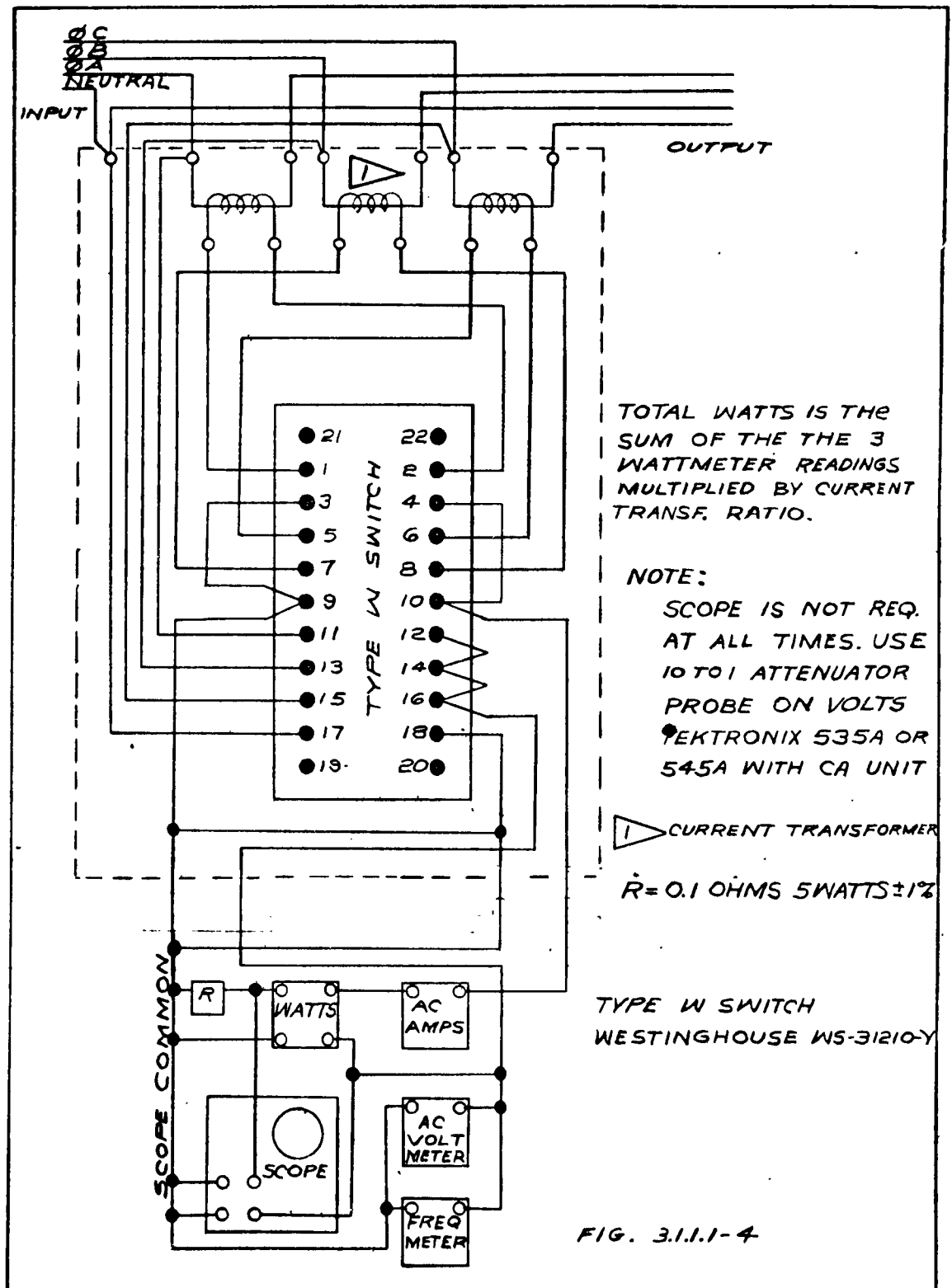


Figure 3.1.1.1-2





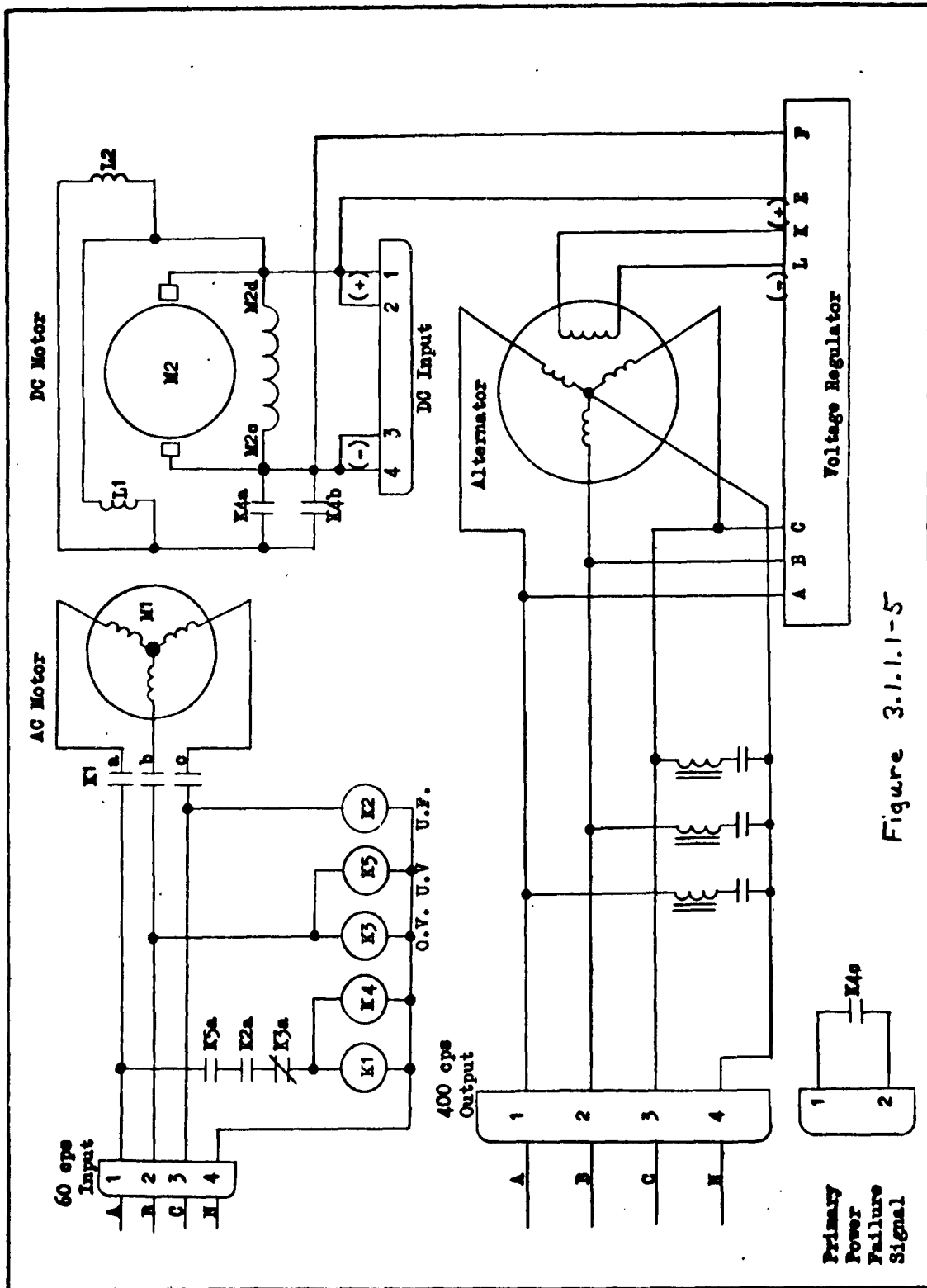
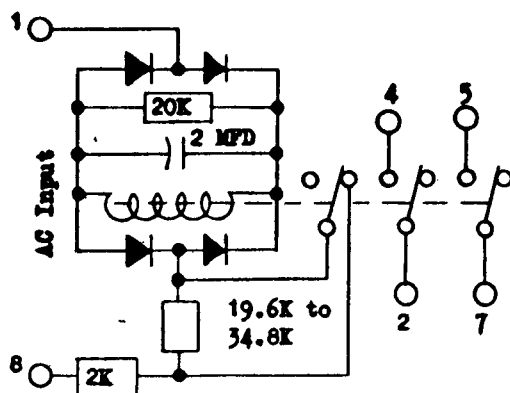
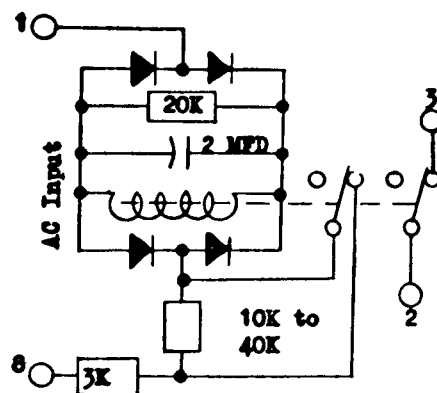


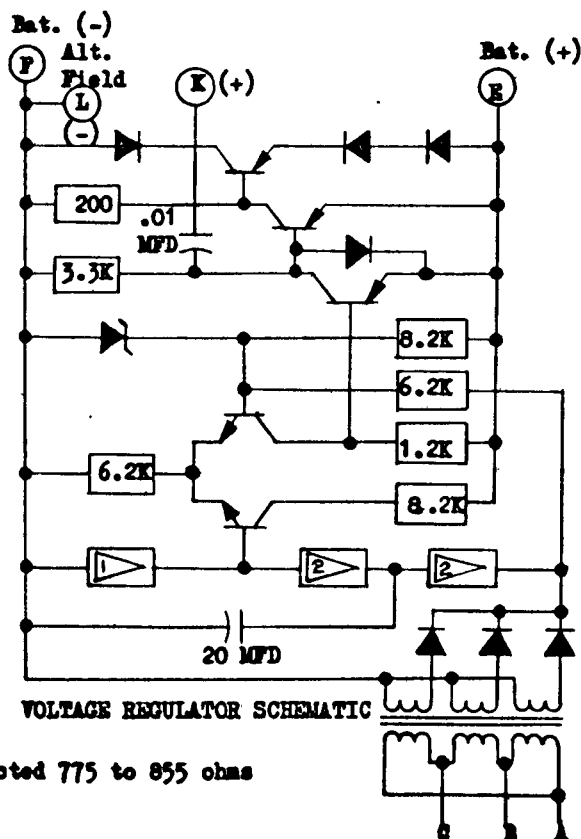
Figure 3.1.1-5



Undervoltage Relay K5



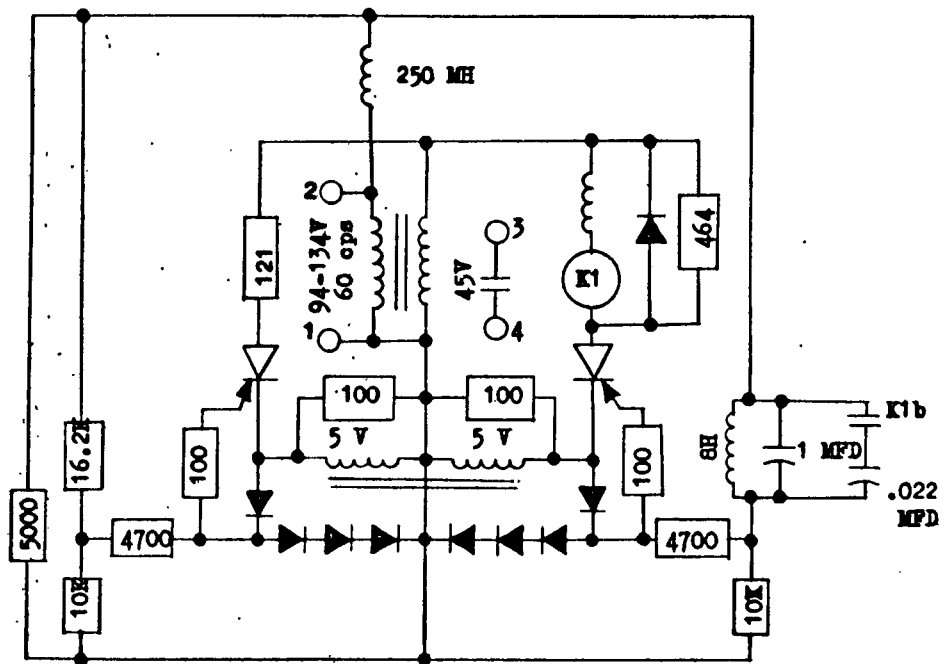
Overvoltage Relay K3



Selected 775 to 855 ohms

Selected 1774 to 1846 ohms

Figure 3.1.1.1-6



Under Frequency Relay K2

Figure 3.1.1.1-7

TEST 3.1.1.2

1. Title

LCP Load Test, Launch Control Console

2. Objectives

To determine the power requirements of the LCC for comparison with D2-4853 which shows 6.5 amperes at 28 volts and 2.1 amperes at 120 VAC. The DC power required will be determined as a function of the Lamp Test. AC power is a function of alarm activation.

3. Description

- 3.1 Connect the equipment as shown in Figure 3.1.1.2-1 with breakers open.
- 3.2 Close the DC breaker. No lamps shall light.
- 3.3 Close the AC breaker. No alarm shall sound.
- 3.4 Record AC and DC currents and voltages.
- 3.5 Activate lamp test for LF No. 1. All indicators for LF No. 1 shall light. No alarm shall sound. Record the DC current and voltage.
- 3.6 Repeat step 3.5 for each LF.
- 3.7 Activate Alarm No. 1 by depressing Alarm No. 1 Test button.
Record AC and DC currents and voltages.
- 3.8 Depress Alarm Reset. Alarm shall cease.
- 3.9 Activate Alarm No. 2 by depressing Alarm No. 2 Test button. Record AC and DC currents and voltages.
- 3.10 Repeat step 3.7 without resetting.
- 3.11 Reset Alarm
- 3.12 Test Complete.



4. Equipment in Test

4.1 Launch Control Console

4.2 LCF Power Group

4.3 LCF Motor-Generator Set

5. Test Equipment Required

5.1 Multimeter, Simpson 260 (2)

5.2 Differential Voltmeter, Fluke 803.

6. Data Requirements

Record all measurements and observations in the Test Log.



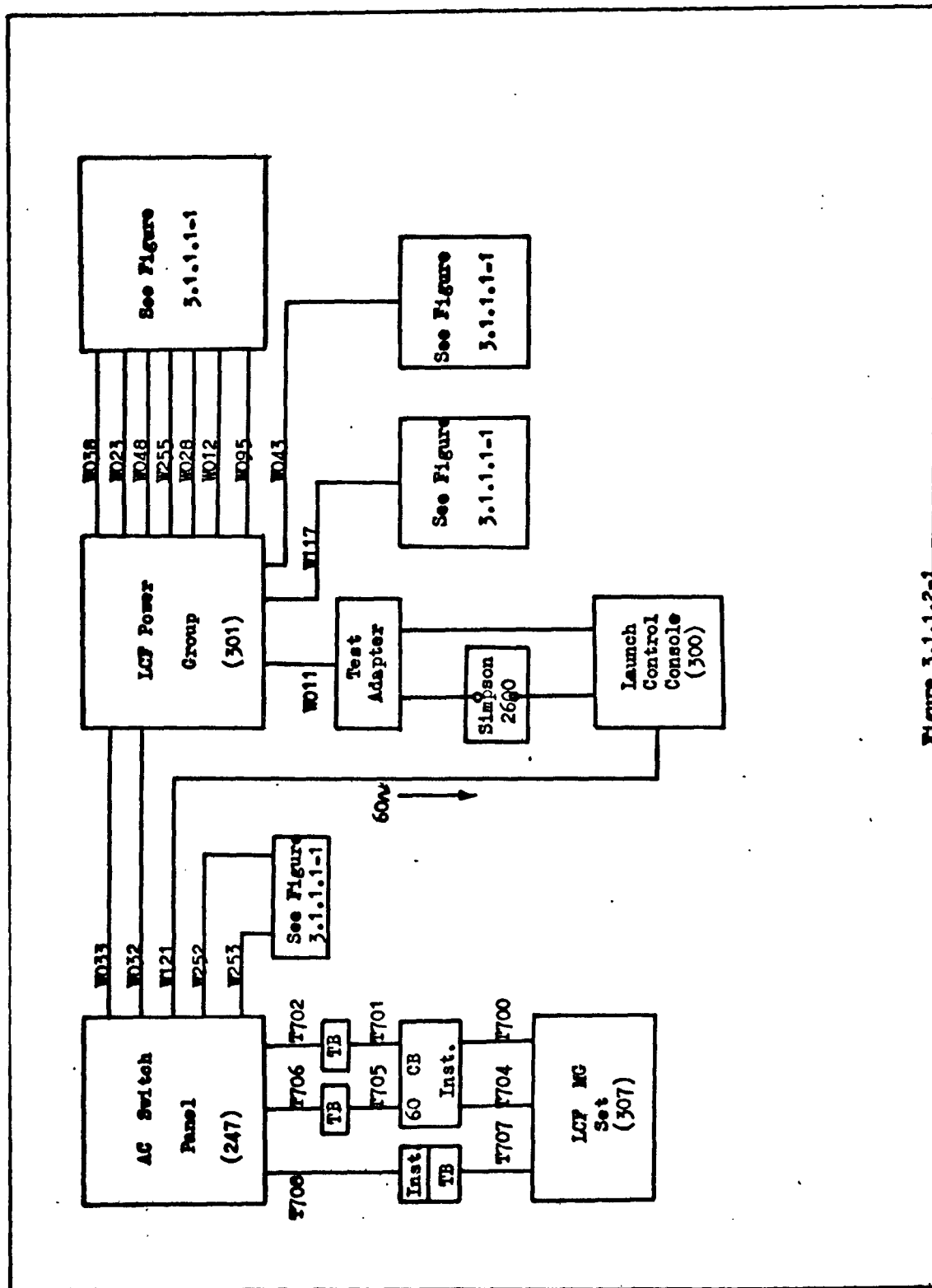


Figure 3.1.1.2-1

TEST 3.1.1.3

1. Title

LCF Load Test, Communications Panel

2. Objective

To determine the power requirements of the Communications Panel in the LCC or CCC, for comparison with D2-4853.

3. Description

3.1 Connect the equipment per Figure 3.1.1.3-1.

3.2 Release all switches on the CCC and set the volume control to minimum.

3.3 Measure the voltage, current and ripple at 28 volt and 24 volt inputs.

3.4 Activate LF #1 and RING buttons and repeat 3.3.

3.5 Activate HVC RING ALL button and repeat 3.3.

3.6 Apply a 1000 cps -13 dbm tone to the HVC Receive input, set VOLUME CONTROL to maximum and repeat 3.3.

3.7 Determine combinations of functions producing maximum current and repeat measurements per 3.3.

4. Equipment in Test

4.1 Launch Control Console (300)

4.2 Communications Control Console

4.3 LCF Power Group

4.4 LCF M-G Set

4.5 AC Switch Panel

5. Test Equipment Required

5.1 Oscilloscope, Tektronix 545A or 555.

5.2 Oscilloscope Preamps, Types CA and D

5.3 Oscilloscope Camera

5.4 Multimeter, Simpson 260 (4)

5.5 24 volt Power Supply

5.6 Audio Oscillator

5.7 Audio VTVM

6. Data Requirements

Photographs will be required for measurements of ripple and transients.



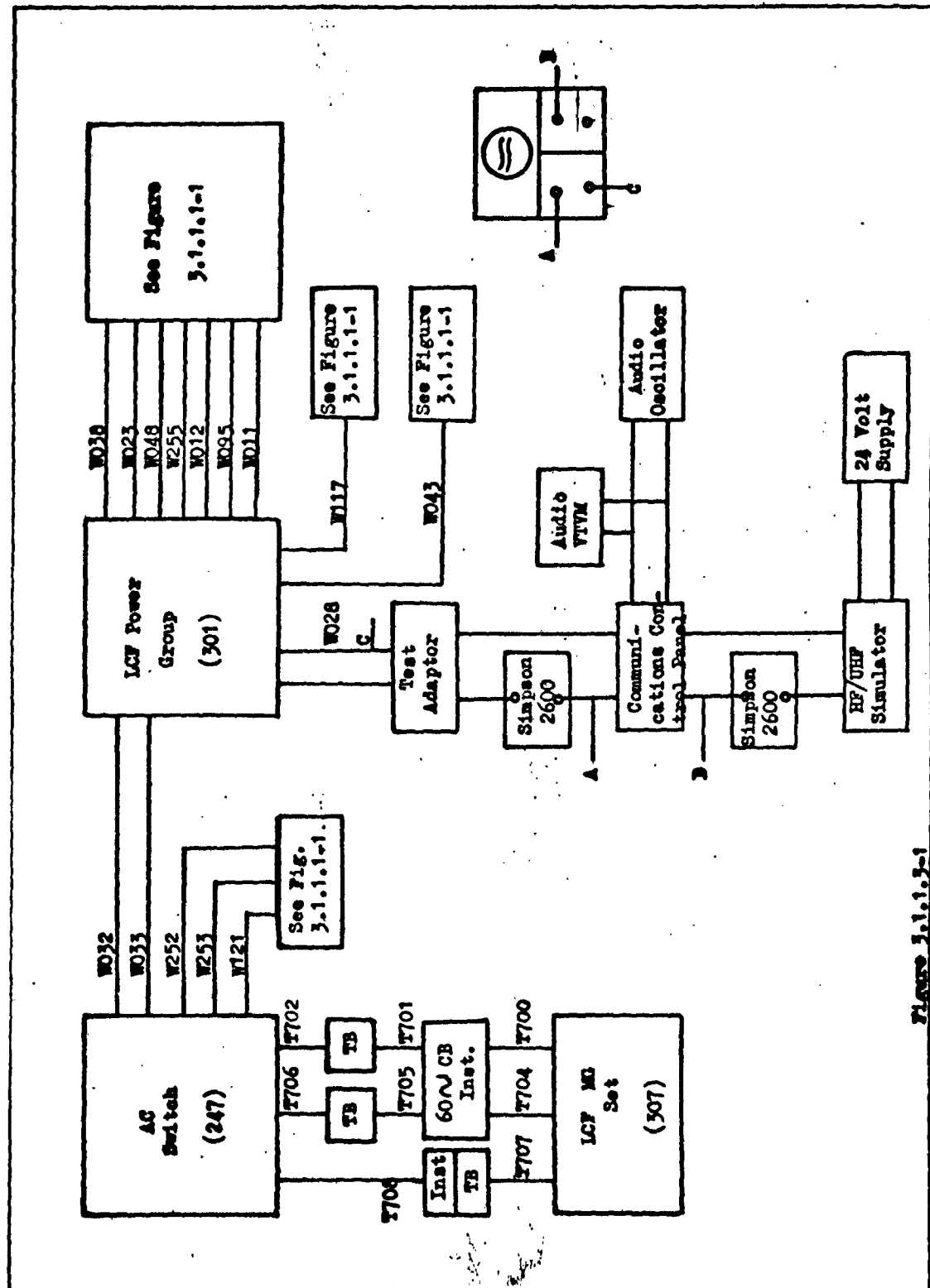


Figure 3.1.1.1-1

TEST 3.1.1.4

1. Title

LCF Load Test, SCN Equipment

2. Objectives

To determine the power requirements of the LCF/SCN Equipment for comparison with D2-4853 which shows 19.7 amperes at 28 volts.

3. Description

3.1 Connect the equipment per Figure 3.1.1.4-1 with all breakers open.

3.2 Verify cooling system is on.

3.3 Verify that all SCN DC Converter breakers are open.

3.4 Close breakers at LCF Power Group for SCN Racks.

3.5 Measure voltage at entrance to Rack 305, Status Message Processing Group. Voltage should be 28.0 to 30.5 volts DC.

3.6 Close breaker at Rack 305. Press Lamp Test button and verify that lamps light.

3.7 Close breaker at Rack 304 and verify. Perform a lamp test at that rack.

3.8 Turn on Rack 303.

3.9 Record voltage and current at each rack. Voltage shall be between 28.0 and 30.5 volts DC.

3.10 Measure ripple at input to each rack. Photograph waveforms.

3.11 Activate Trip lever at Rack 304. Breaker shall trip again.

3.12 Measure ripple at Racks 305, 303.

3.13 Activate trip at Rack 305.



3.14 Measure ripple at Rack 303.

3.15 Open primary breakers at LCF Power Group.

3.16 Test Complete.

4. Equipment in Test

4.1 Digital Data Group (303)

4.2 Command Message Processing Group (304)

4.3 Status Message Processing Group (305)

4.4 LCF M-G Set (307)

4.5 LCF Power Group (301)

4.6 AC Switch Panel (247)

5. Test Equipment Required

5.1 DC Ammeter 0 - 20 amps (2)

5.2 DC Ammeter 5 amps

5.3 Voltmeter, Fluke 804 or 803.

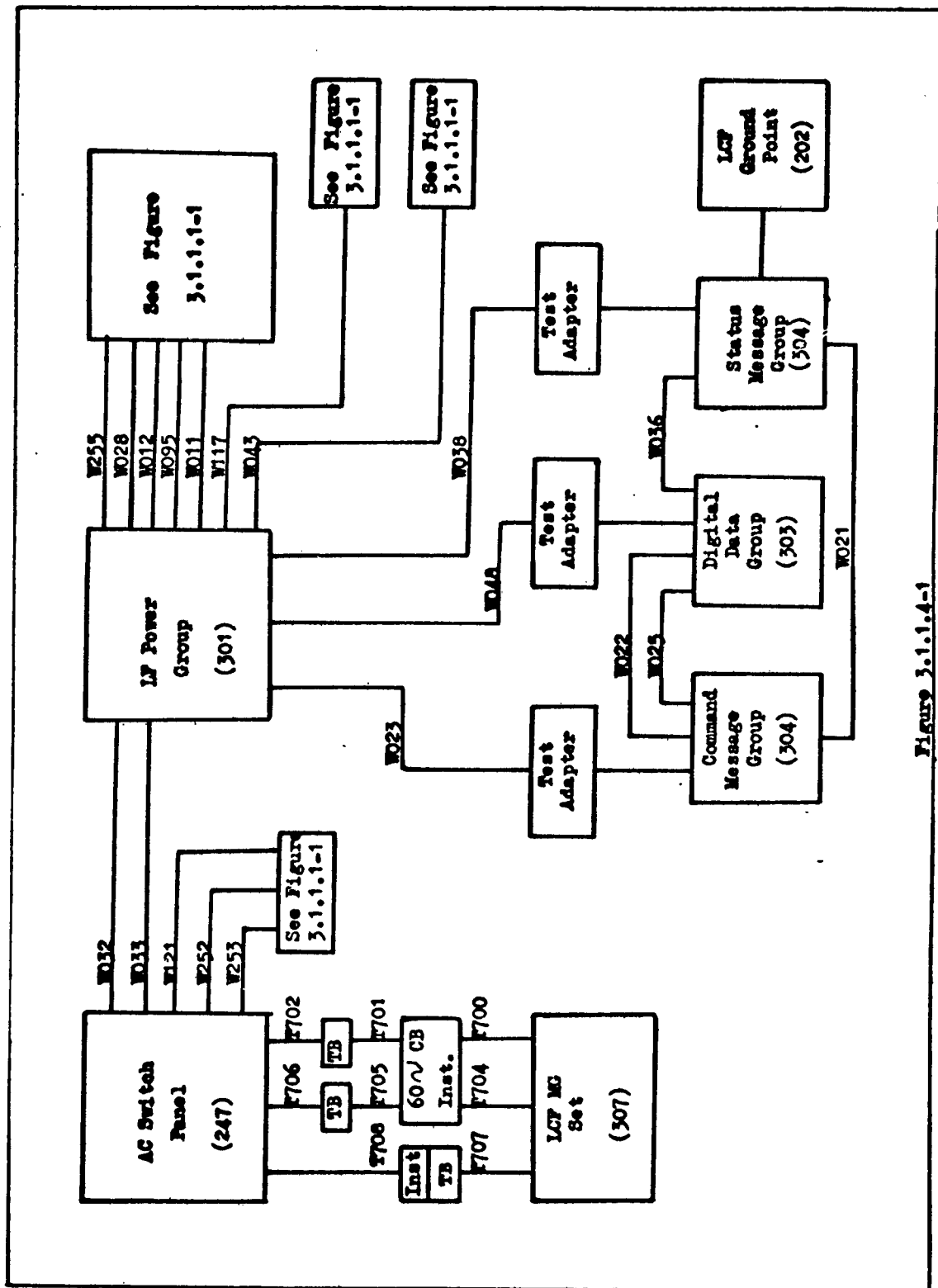
5.4 Oscilloscope, Tektronix 545A or 555.

5.5 Oscilloscope Preamps, Tektronix Types CA and D.

5.6 Oscilloscope camera.

6. Data Requirements

Record all data and observations in the Test Log. Copies of photographs will be included.



TEST 3.1.1.5

1. Title

LCF Load Test, Arming & Status Panel

2. Objectives

To determine the DC power requirements of the CCC for comparison with D2-4853, which shows 1.0 amperes at 28 volts DC.

3. Description

3.1 Connect the equipment per Figure 3.1.1.5-1.

3.2 Turn Volume Control to maximum setting.

3.3 Measure current and voltage at U311J2P1R2.

3.4 Apply a -6 dbm 1000 cps tone at U311J1P36R37. Set LF Selector switch to LF 2 position.

3.5 Repeat step 3.3.

3.6 Test Complete.

4. Equipment in Test

4.1 Communications Control Console (311)

4.2 LCF Power Group (301)

4.3 LCF M-G Set (307)

4.4 AC Switch Panel (247)

5. Test Equipment Required

5.1 Multimeter, Simpson 260

5.2 Voltmeter, Fluke 803

6. Data Requirements

Record all data and observations in the Test Log.



TEST 3.1.1.6

1. Title

LCF Load Test, Survival Lights

2. Objectives

To determine the power requirements of the Survival lights at the LCF for comparison with D2-4853, which shows 0.7 amperes at 28 volts DC.

3. Description

3.1 Connect the equipment as shown in Figure 3.1.1.6-1 with charger off.

3.2 Measure current at 36 volt DC input. Measure light intensity.

3.3 Measure current at 28 volt DC input by adjusting R_1 . Measure light intensity.

3.4 Test complete.

4. Equipment in Test

4.1 LCF Survival Lights

4.2 LCF Power Group

4.3 AC Switch Panel

5. Test Equipment Required

5.1 Multimeter, Simpson 260

5.2 Voltmeter, Fluke 801.

5.3 Light Meter

6. Data Requirements

Record all data in the Test Log.

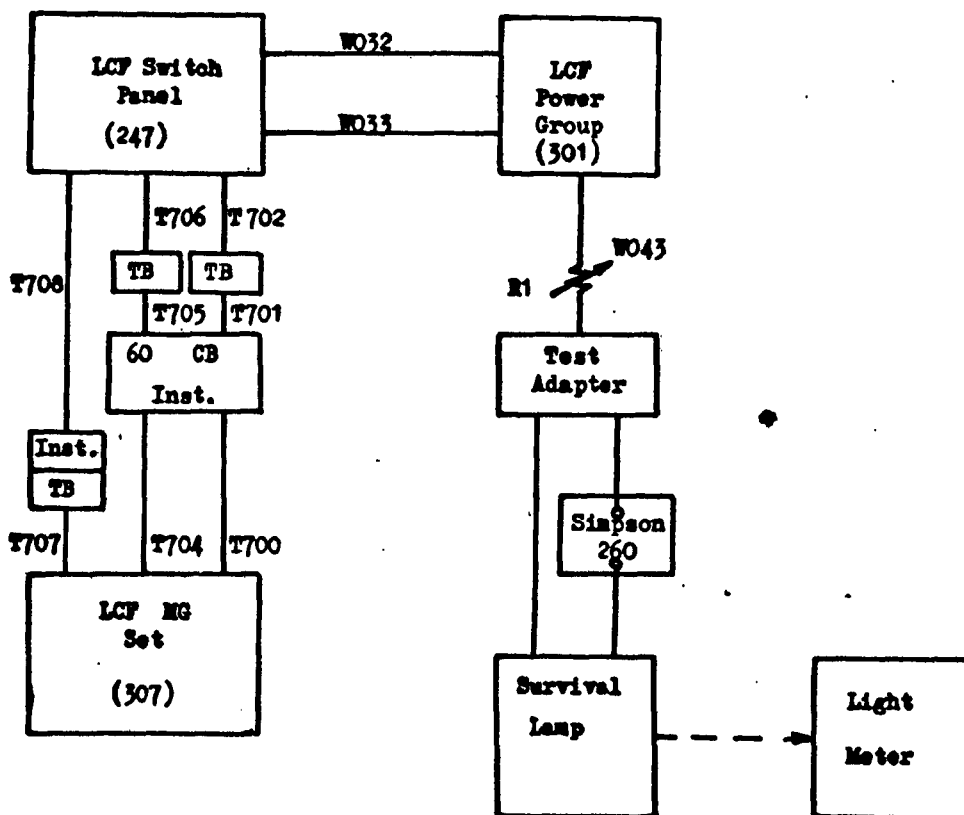


Figure 3.1.1.6-1

TEST 3.1.1.7

1. Title

LCP Load Test, SAC CTE

2. Objectives

To determine the power requirements of the SAC CTE for comparison with D2-4853 which shows 1 amperes at 28 volts DC.

3. Description

3.1 Connect the equipment per Figure 3.1.1.7-1.

3.2 The DC breaker and monitor input current and voltage.

3.3 Determine ripple at input to SAC CTE. Photograph waveforms.

3.4 Determine off-on-off transients. Photograph waveforms.

4. Equipment in Test

4.1 SAC CTE (320)

4.2 LCP M-G Set (307)

4.3 LCP Power Group (301)

4.4 AC Switch Panel (247)

5. Test Equipment Required

5.1 Multimeter, Simpson 260

5.2 Voltmeter, Fluke 801

5.3 Oscilloscope, Tektronix 545A or 555

5.4 Oscilloscope Preamps Types CA and D

5.5 Oscilloscope Camera

6. Data Requirements

Record all data and observations in the Test Log.

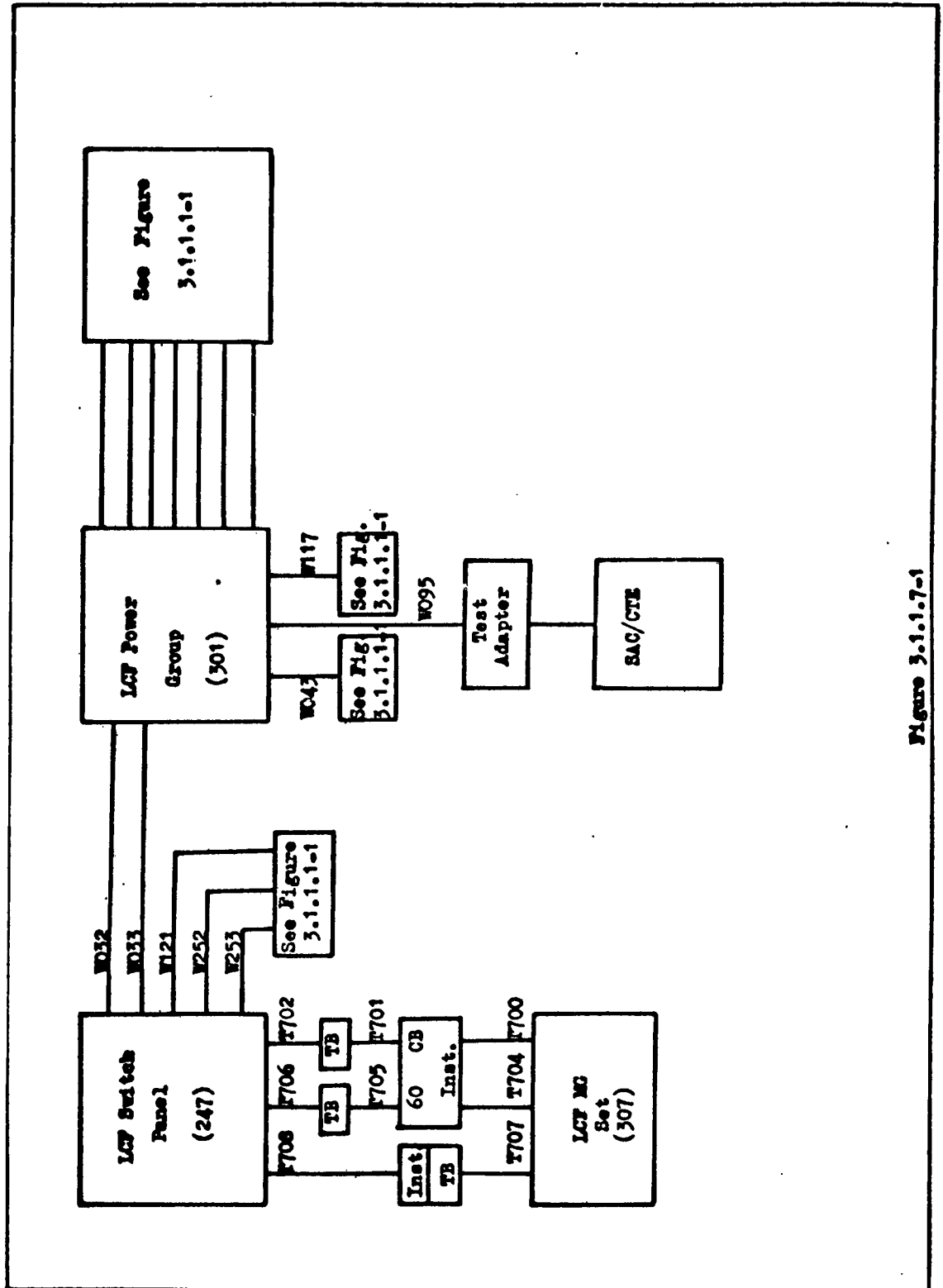


Figure 3.1.1.7-1

TEST 3.1.1.8

1. Title

LCF Load Test, 465L Equipment

2. Objective

To determine the AC Power requirements of the 465L equipment for comparison with D2-4853.

3. Description

3.1 Connect the equipment per Figure 3.1.1.8-1.

3.2 Measure the AC voltage, current, harmonic distortion, frequency and power factor.

Measure inrush current and frequency.

3.3 Operate functions of the equipment to produce maximum loading. Record current and distortion measurements.

4. Equipment in Test

4.1 465L Rack #7

4.2 465L Rack #8

4.3 AC Switch Panel

4.4 LCF M-G Set

4.5 LCF Power Group

5. Test Equipment Required

5.1 Oscilloscope, Tektronix 545A or 555

5.2 Oscilloscope, Preamp, Tektronix Type CA

5.3 Oscilloscope Camera

5.4 AC Voltmeter, Fluke 803

5.5 Multimeter

5.6 Distortion Analyzer, Hewlett-Packard 330 B/C/D

5.7 Spot Meter

6. Data Requirements

Record all data and observations in the Test Log.

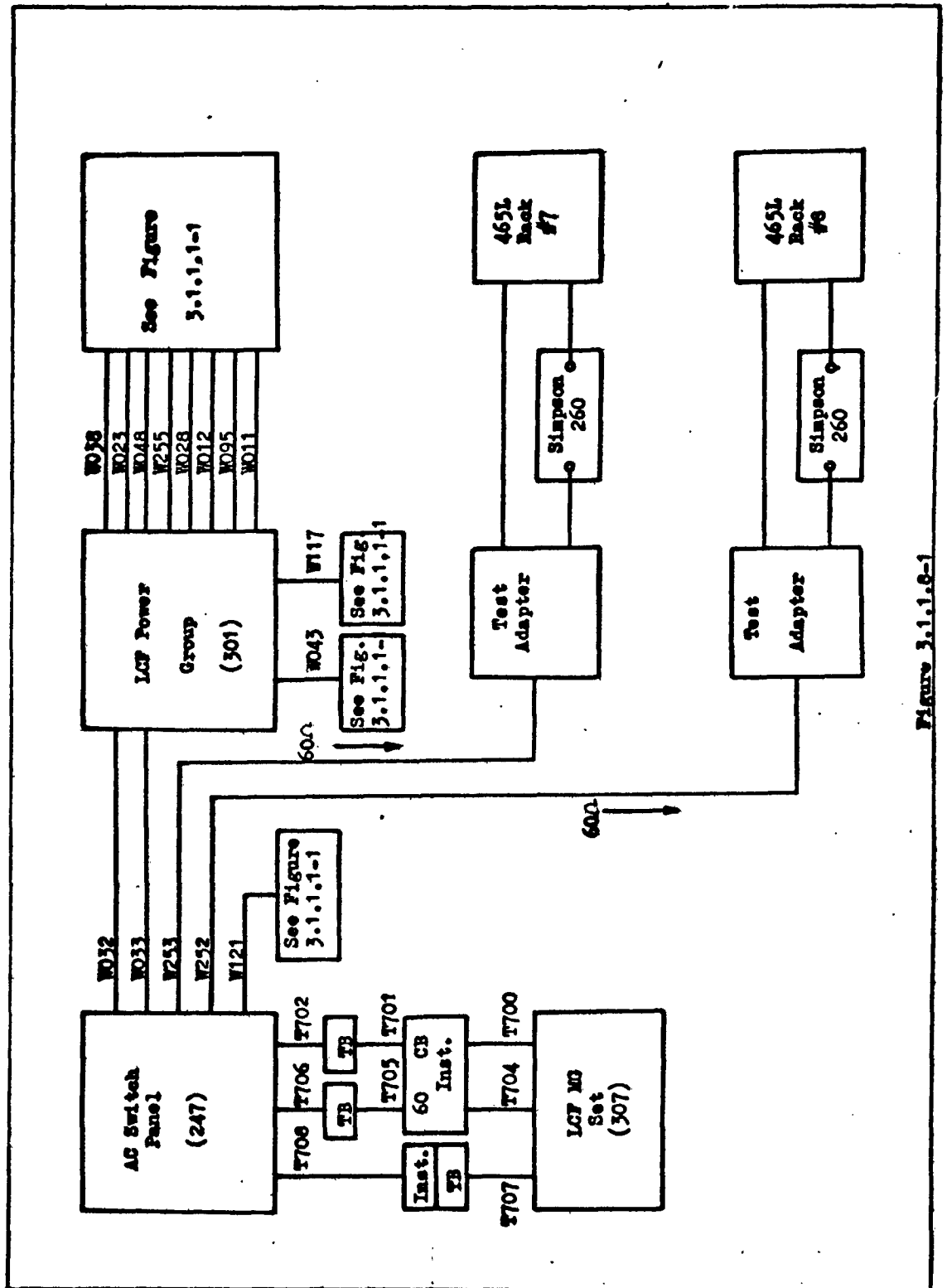


Figure 3.1.1.8-1

TEST 3.1.1.9

1. Title

LCF Load Test, Telephone Connecting and Switching Set.

2. Objective

To determine the AC Power requirements of the Telephone Connecting and Switching set for comparison with D2-4853.

3. Description

3.1 Connect the equipment per Figure 3.1.1.9-1.

3.2 Measure the AC voltage, current, harmonic distortion, frequency and power factor.

3.3 Apply tone to all inputs and repeat measurements of 3.1.

3.4 Activate relays and repeat 3.2.

4. Equipment in Test

4.1 Telephone Connecting and Switching Set

4.2 LCF Power Group

4.3 AC Switch Panel

5. Test Equipment Required

5.1 Audio Oscillator, Hewlett-Packard 200CD

5.2 Audio VTVM

5.3 Oscilloscope, Tektronix 545A or 555

5.4 Oscilloscope Preamp, Tektronix Type GA

5.5 Spt Meter

6. Data Requirements

Photograph waveforms as required and record data in Test Log.

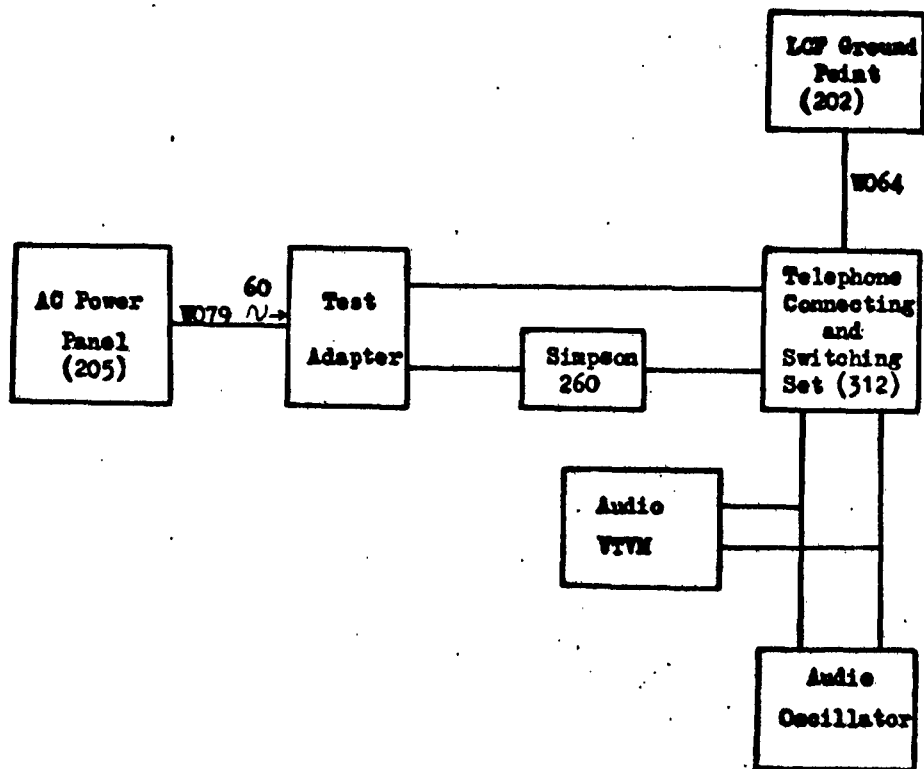


Figure 3.1.1.9-1

TEST 3.1.1.10

1. Title

LCF Load Test, Emergency Environmental Equipment

2. Objective

To determine the power requirements and load characteristics of the Emergency Environmental Equipment for comparison with D2-4853.

3. Description

3.1 Connect the equipment per Figure 3.1.1.10-1 with the Battery Charger OFF.

3.2 Measure current at 25, 28 and 33 volts by adjusting R_1 .

3.3 Determine inrush current at startup. Photograph waveform.

4. Equipment in Test

4.1 Emergency Environmental Equipment

4.2 LCF Power Group

4.3 AC Switch Panel

5. Test Equipment

5.1 Multimeter, Simpson 260

5.2 Voltmeter, Fluke 801 or 803

5.3 Oscilloscope, Tektronix 545A or 555

5.4 Oscilloscope Preamps, Tektronix Types CA and D

5.5 Oscilloscope Camera.

6. Data Requirements

Record all data and observations in the Test Log. Copies of photographs will be included.

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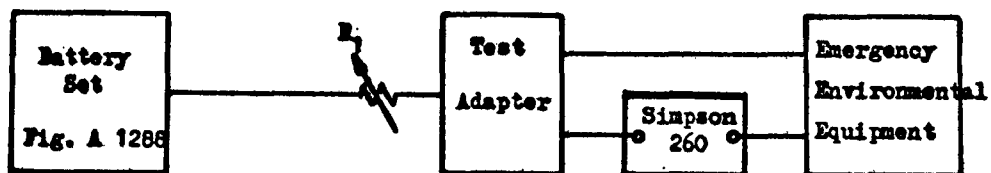


Figure 3.1.1.10-1

TEST 3.1.1.11

1. Title

LCF Lead Test, Battery Charger

2. Test Objective

To determine the power requirements of the LCF Battery Charger for comparison with D2-4853.

3. Description

3.1 Connect the equipment per Figure 3.1.1.11-1.

3.2 Measure the voltage and current input and output at no-load, nominal load, and full-load.

3.3 Measure on-off-on transients and harmonic distortions induced at the input.

3.4 Measure ripple at the output at no-load, nominal load and full-load.

4. Equipment In Test

4.1 LCF Power Group

4.2 AC Switch Panel

5. Test Equipment Required

5.1 Multimeter, Simpson 260

5.2 Voltmeter, Fluke 801 or 803

5.3 Oscilloscope, Tektronics 545A or 555

5.4 Oscilloscope Preamps, Tektronics Types CA and D.

5.5 Oscilloscope camera.

6. Data Requirements

Record all data and observations in the Test Log. Copies of photographs will be included.

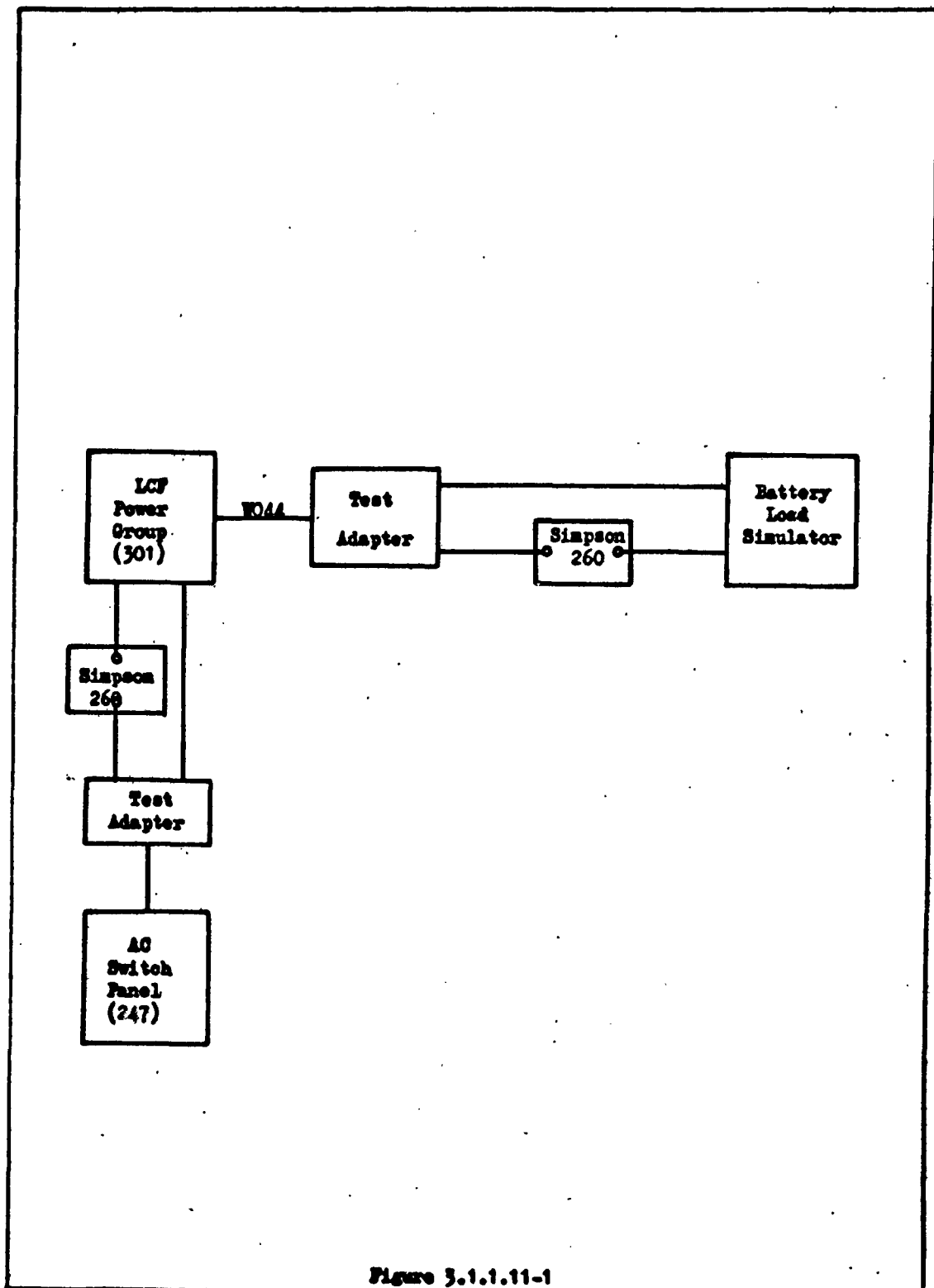


Figure 3.1.1.11-1

TEST 3.1.1.12

1. Title

LCF Load Test, Motor Generator Set

2. Objective

To determine the power requirements of the LCF Motor Generator for comparison with D2-4853.

3. Description

3.1 Connect the equipment per Figure 3.1.1.12-1.

3.2 Measure the voltage, current and power factor at the input and output of the Motor-Generator Set at no-load, nominal-load and full-load while operating on primary power.

3.3 Determine the harmonic distortion induced at the input and outputs of the M-G Set under conditions of 3.2. Photograph waveforms.

3.4 Determine ripple and frequency variation at the outputs of the M-G Set under conditions of 3.2. Photograph waveforms.

3.5 Determine off-on-off transients and inrush current at the input under conditions of 3.2. Photograph waveforms.

3.6 Determine 3.2 through 3.4 for Emergency Power operation.

4. Equipment in Test

4.1 LCF Motor-Generator Set

4.2 LCF Power Group

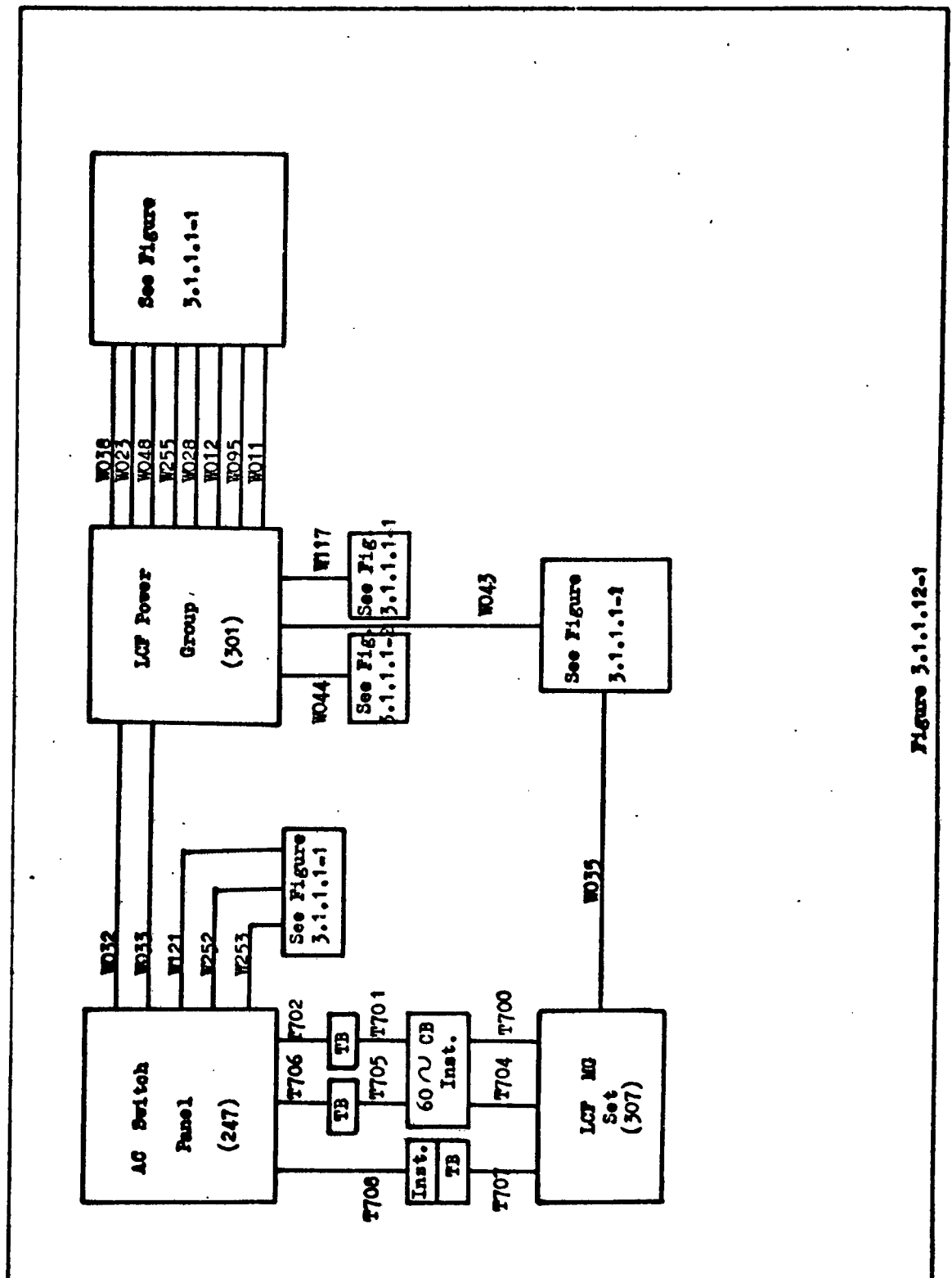
4.3 AC Switch Panel

5. Test Equipment Required

- 5.1 Multimeter, Simpson 260
- 5.2 Voltmeter, Fluke 801 or 803.
- 5.3 Oscilloscope, Tektronix 545A or 555
- 5.4 Oscilloscope Preamps, Types CA and D
- 5.5 Oscilloscope Camera
- 5.6 Distortion Analyzer, Hewlett-Packard 330 B/C/D
- 5.7 Eput Meter

6. Data Requirements

Record all data in the Test Log.



TEST 3.1.1.13

1. Title

LCF Load Test, Motor Generator Field

2. Test Objective

To determine the power requirements of the Motor Generator field for comparison with D2-4853.

3. Description

- 3.1 Connect the equipment as shown in Figure 3.1.1.13-1.
- 3.2 Measure current input to the field at 26, 36 and 38.5 volts by adjusting R1. (Battery Charger On).
- 3.3 Determine ripple at the input to the MG field at conditions of 3.1. Photograph waveforms.
- 3.4 Determine Inrush current at the input to the MG field. Photograph waveforms.
- 3.5 Shut-down primary power per Test 3.1.1.12.
- 3.6 Measure current and voltage at the MG field input while operating on Emergency Power per Test 3.1.1.12.

4. Equipment in Test

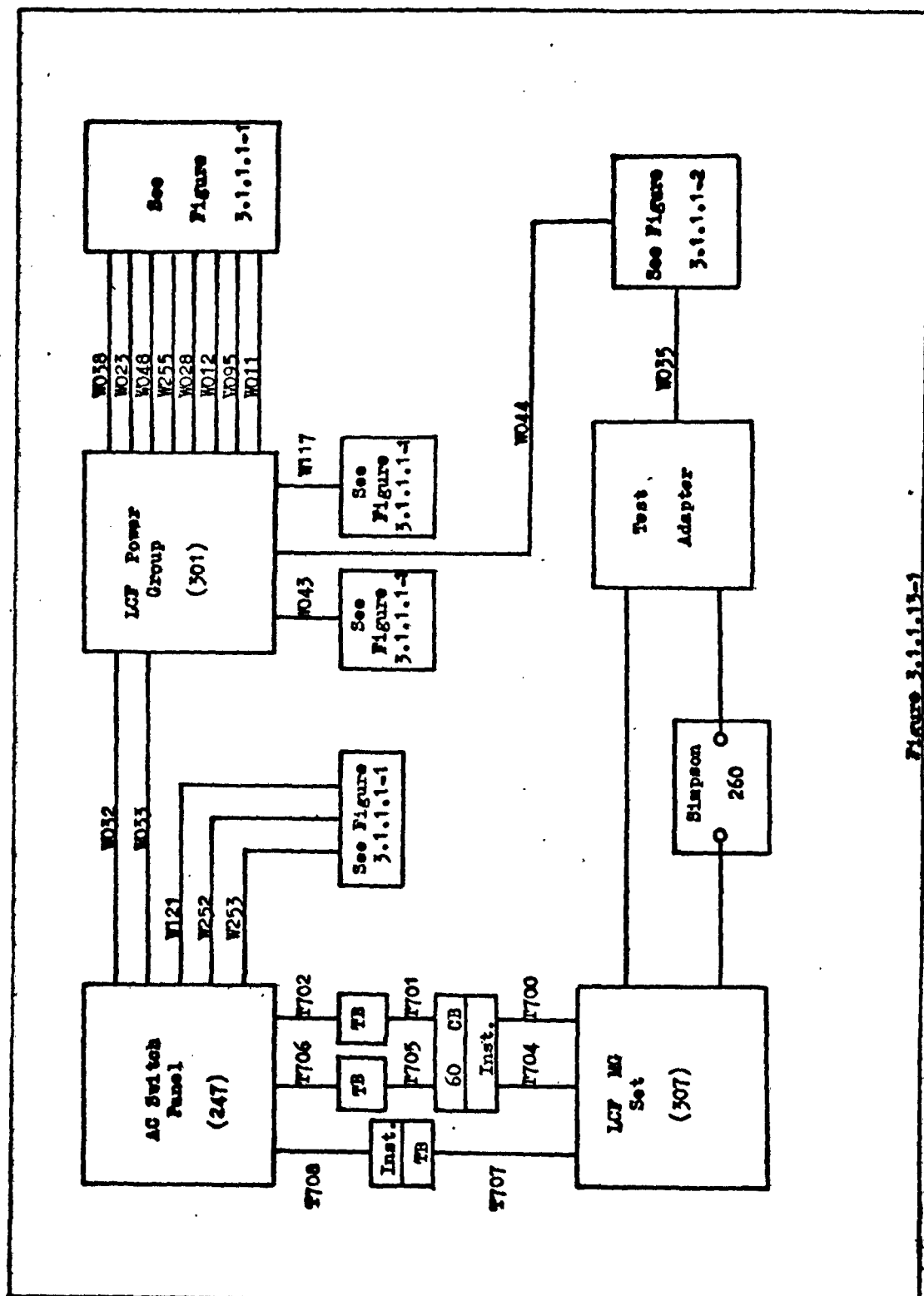
- 4.1 MG Set
- 4.2 LCF Power Group
- 4.3 AC Switch Panel

5. Test Equipment Required

- 5.1 Oscilloscope, Tektronics 555
- 5.2 Oscilloscope Preamps, Tektronics Type D
- 5.3 Voltmeter, Fluke 801 or 803
- 5.4 Multimeter, Simpson 206

6. Data Requirements

- Record all data and observations in the Test Log. Photographs of waveforms will be included.



TEST 3.1.2.1

1. Title

LCF Power Startup, Lab Power.

2. Objectives

To establish a turn-on procedure for the LCF when operating on Lab power.

3. Description

3.1 Connect the equipment per Figures 3.1.2.1-1 and Figure 3.1.2.1-2.

3.2 Verify that cooling is on. Reset Cooling Safe Unit if necessary.

3.3 Verify that MAIN POWER CONTROL is on at the AC Switch Panel. Reset if necessary.

3.4 Verify that the breakers on the SCN racks are open.

3.5 Turn on Perkins Power Supplies. Reset the voltage trip on each supply.

3.6 Turn on battery switch for the LCF supply.

3.7 Close the SCN breakers at the DC Power Panel.

3.8 Close the breakers at the SCN racks. Verify that LAMP TEST functions are operative.

3.9 Close the LCC breaker at the DC Power Panel.

3.10 Reset lamps on the LCC by using the LAMP TEST function.

3.11 Close breakers at the DC Power Panel for the SAC/CTE, MS/CTE, CCC and 465L Patch Panel.

3.12 Verify that 465L ON FACILITY POWER and LCC ON FACILITY POWER lamps are lit at the AC Switch Panel.

3.13 Close the 465L and LOC breakers at the AC Switch Panel.

3.14 Close the LCF/SIN TCSB breaker at the AC 60 Circuit Breaker (249).

4. Equipment in Test

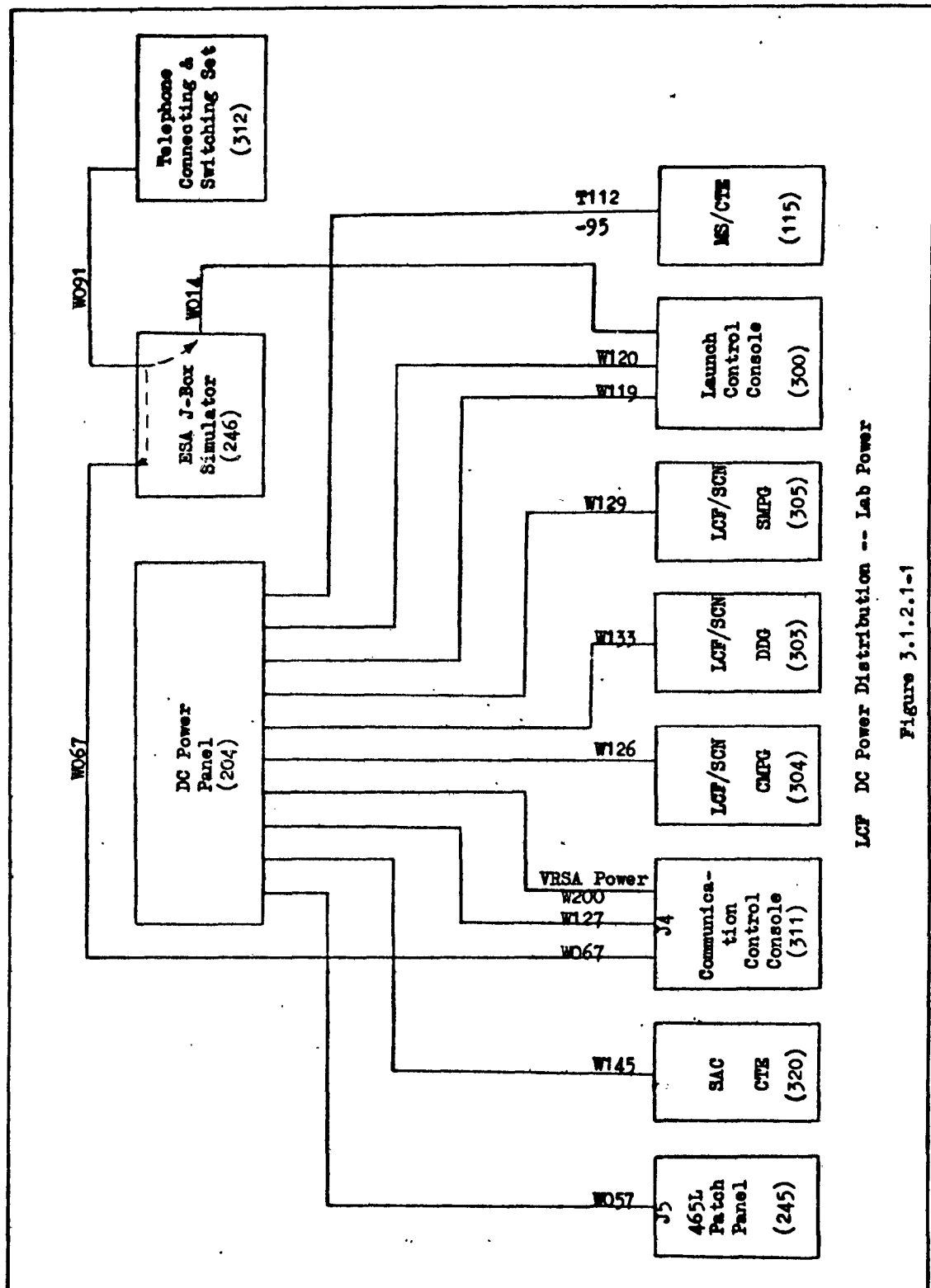
Refer to Figures 3.1.2.1-1 and 3.1.2.1-2.

5. Test Equipment Required

None

6. Data Requirements

Record all observations in the Test Log.



LCF DC Power Distribution -- Lab Power

Figure 3.1.2.1-1

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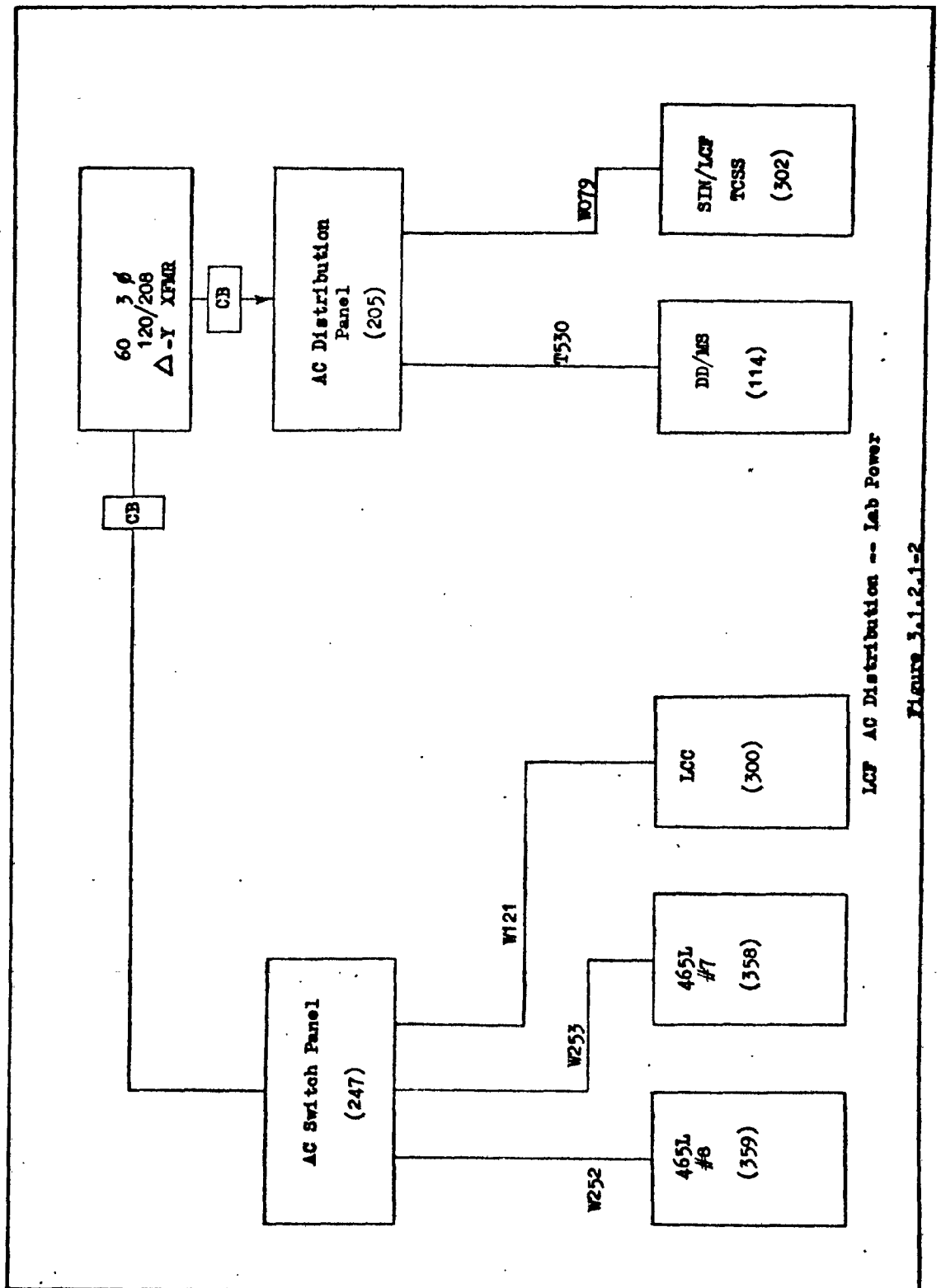
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LCF AC Distribution -- Lab Power

Figure 3.1.2.1-2

TEST 3.1.2.2

1. Title

LCP Power Startup, H&D Power

2. Objectives

To establish a turn-on procedure for the LCP when using
H&D Power.

3. Description

3.1 Connect the equipment per Figures 3.1.2.2-1 and 3.1.2.2-2.

3.2 Verify that cooling is on. Reset Cooling Safe Unit if
necessary.

3.3 Verify that the following lamps are on at the AC Switch
Panel:

Main Power Control

LCP Power Group from M-G Set

LCC on M-G Set

465L on M-G Set

LCP M-G Set 60 ~

LCP Power Group 60 ~

LCP Power Group 400 ~

3.4 Close the breakers to the SCN equipment at the LCP power
group.

3.5 Close the breaker to the LCC at the LCP Power Group.

3.6 Reset the lamp drivers by using the lamp test function
at the LCC.

3.7 Turn on all other breakers at the LCC.

3.8 Turn on the AC breakers at the AC switch panel to the
LCC and 465L.

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4. Equipment In Test

Refer to Figures 3.1.2.2-1 and 3.1.2.2-2.

5. Test Equipment Required

None.

6. Data Requirements

Record all observations in the Test Log.

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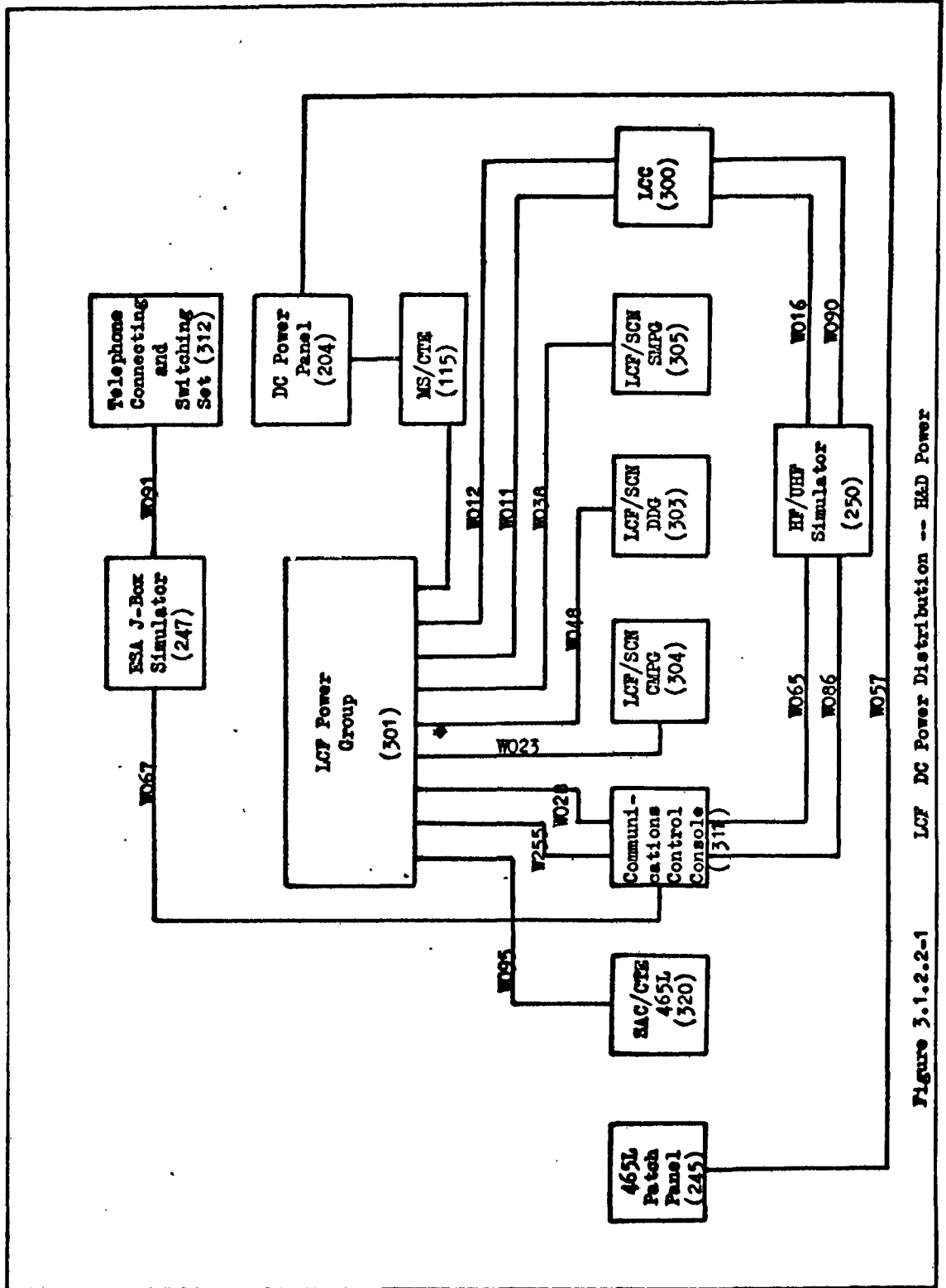
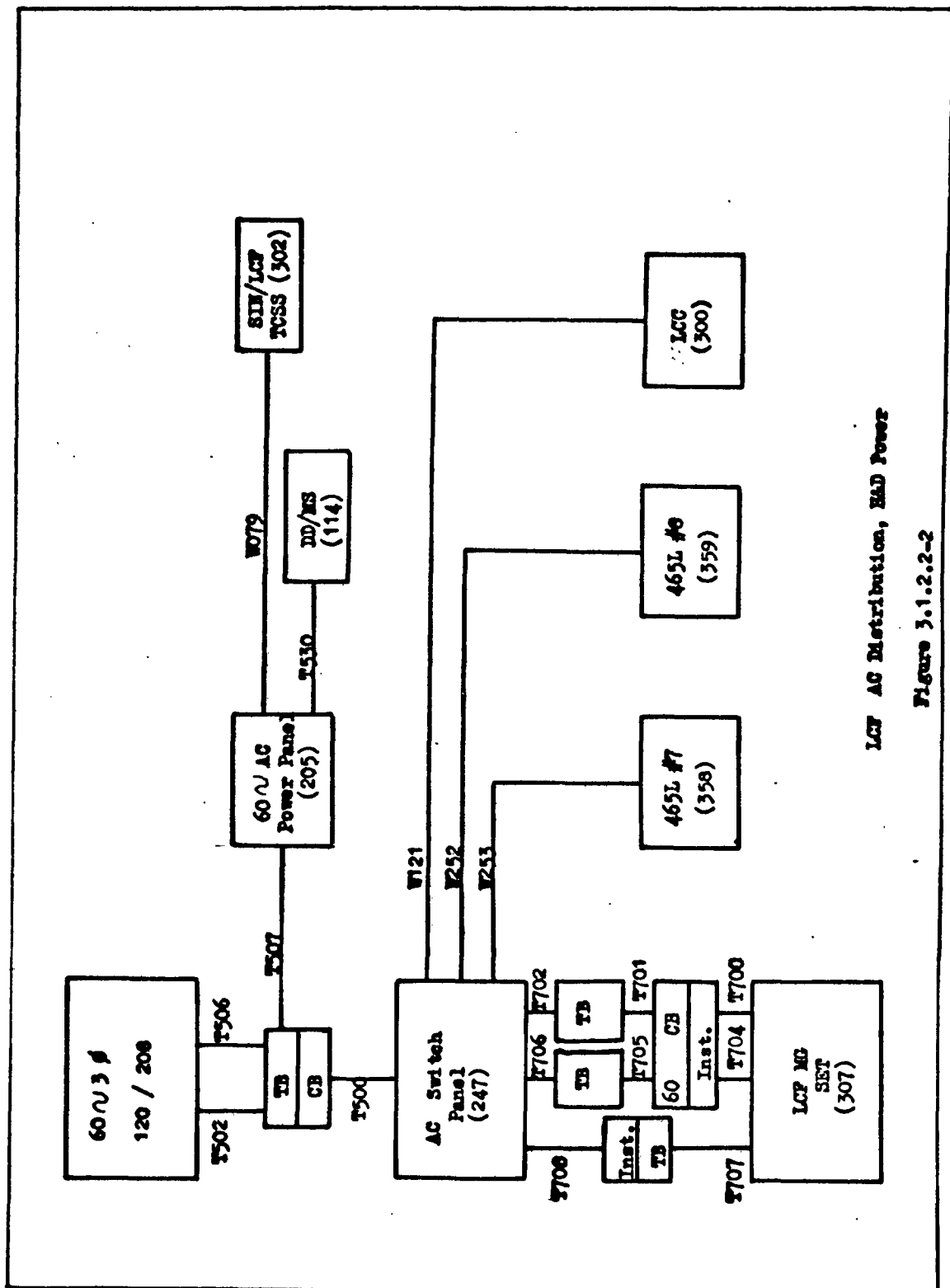


Figure 3.1.2.2-1 LCF DC Power Distribution -- H&D Power



LCF AC Distribution, RAD Power

Figure 3.1.2.2-2

TEST 3.1.4.1

1. Title

LCF Operation on H&D Power

2. Objective

To determine the loading characteristics of the LCF operational equipment plus dummy loads to simulate complete loading of the LCF H&D power subsystem during LCF operation.

3. Description

3.1 Connect the equipment per Figures 3.1.4.1-1 and 3.1.1.1-2.

3.2 Utilize dummy loads to simulate complete loading of the LCF power subsystem per Test 3.1.1.1.

3.3 Startup the system per Test 3.1.2.1

3.4 Monitor the power system transients, frequency, noise and ripple during all LCF control and monitoring operations.

3.5 Issue the following LCF command messages from the LCF control system and verify the SCN command messages at the Receive Patch

Panel:

SCN Test

Calibrate

Target Alpha

Target Beta

Launch

Launch Inhibit



Test 3.1.4.1 (cont.)

3.6 Issue LF status messages per Table 3.1.4.1-1 from the message Generator to the Transmit Patch Panel and verify activation of the status indicators at the LCF monitoring system. Status messages programmed on the message Generator will be transmitted on all ten lines to the SCH/LCF Receive lines.

4. Equipment In Test

4.1 See Figures 3.1.4.1-1 and 3.1.1.1-2

5. Test Equipment

5.1 NRA Instrumentation System

5.2 Oscilloscope, Tektronix 545A

5.3 Plug-In-Unit, Tektronix Type CA

5.4 Frequency Discriminator, Figure 3.1.1.1-3

5.5 Differential Voltmeter, Fluke 803

5.6 LCF Instrumentation assembly

6. Data Requirements

6.1 All tape recorded signals are referenced to 300 mcm ground bus.

Record tape at 60 ips and play back at 7.5 ips. Record all data observed in the M&IR Test Log.

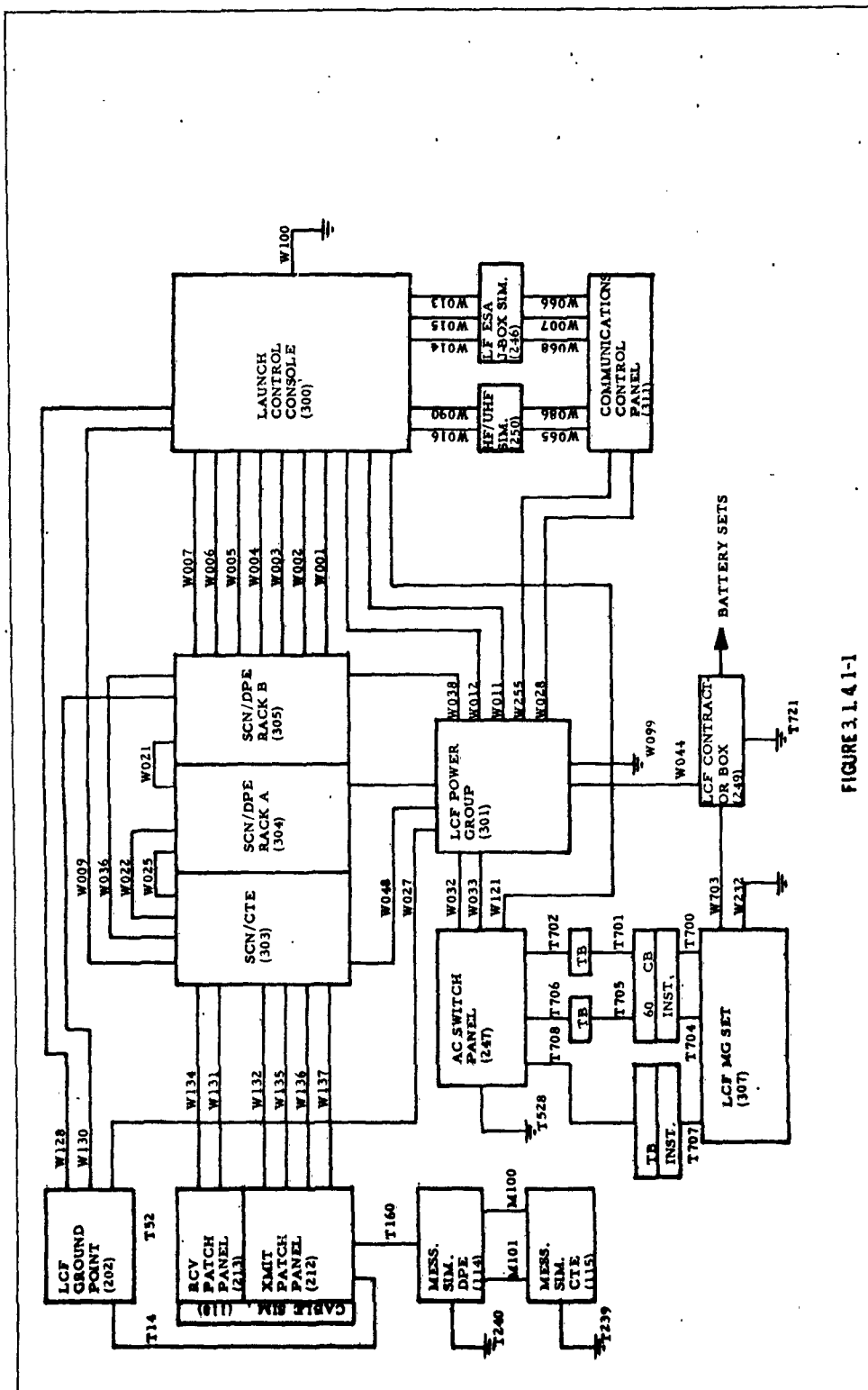


TABLE 3.1.4.1-1

Status	Status Indicators	Alarm	Alarm Indicator
Inner Security	Inner Security Violated	Buzzer	No. 1
Outer Security	Outer Security Violated	Buzzer	No. 1
Warhead Alarm	W/H Alarm	Buzzer	No. 1
Strategic Alert	Strategic Alert	---	
Launch In Process	Launch In Process	---	
Launch Commanded	Launch Command	Bell	No. 2
Armed	Armed	Buzzer	No. 1
Standby	Standby		
Fault	Fault		
SCN Test Received	SCN Test Received	Buzzer	No. 1
Traffic On Net	Traffic On Net		

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TEST 3.1.4.2

1. Title

LCF Transfer to Emergency Power

2. Objective

To determine the loading characteristics of the LCF operational equipment plus dummy loads to simulate complete loading of the LCF H&D power subsystem during transfer to Emergency Power.

3. Description

3.1 Connect the equipment per Figures 3.1.4.1 and 3.1.1.1-2

3.2 Utilize dummy loads to simulate complete loading of the LCF power subsystem per Test 3.1.1.1.

3.3 Startup the system per Test 3.1.2.1.

3.4 Monitor the power system transients, frequency, noise and ripple during system operation.

3.5 Initiate a 60 cycle primary power failure to the LCF MG set to obtain a transfer to Emergency Power.

3.6 Remove the 60 cycle primary power fault to obtain a transfer to Primary Power from Emergency Power.

4. Equipment In Test

4.1 See Figures 3.1.4.1-1 and 3.1.1.1-2

5. Test Equipment

5.1 NRA Instrumentation

5.2 Oscilloscope, Tektronix 545A

5.3 Plug-In-Unit, Tektronix Type CA

5.4 Frequency Discriminator, Figure 3.1.1.1-3

5.5 Differential Voltmeter, Fluke 803

5.6 LCF Instrumentation Assembly.

6. Data Requirements

6.1 All tape recorded signals are referenced to 300 mm ground bus.

Record tape at 60 ips and play back at 7.5 ips. Record all data observed in the M&IR Test Log.

TEST 3.1.4.3

1. Title

LCF Operation on Emergency Power

2. Objective

To determine the loading characteristics of the LCF operational equipment plus dummy loads to simulate complete loading of the LCF H&D power subsystem operating on battery power.

3. Description

3.1 Connect the equipment per Figures 3.1.4.H and 3.1.1.1-2

3.2 utilize dummy loads per Test 3.1.1.1

3.3 Startup the system per Test 3.1.2.1

3.4 Monitor the power system transients, frequency, noise and ripple during during all LCF contrast and monitoring operations.

3.5

3.6 Issue LCF command messages per Test 3.1.4.1, paragraph 3.5.

3.7 Issue LF status commands per Test 3.1.4.1, paragraph 3.6.

4. Equipment

4.1 See Figures 3.1.4.1-1 and 3.1.1.1-2

5. Test Equipment

5.1 NRA Instrumentation System

5.2 Oscilloscope, Tektronix 545A

5.3 Plug-In-Unit, Tektronix Type CA

5.4 Frequency Discriminator, Figure 3.1.1.1-3

5.5 Differential Voltmeter, Fluke 803

5.6 LCF Instrumentation Assembly.

6. Data Requirements

6.1 All tape recorded signals are referenced to 300 mm ground bus.
Record tape at 60 ips and playback at 7.5 ips. Record all data
observed in the M&IR Test Log.

TEST 3.2.1.1

1. Title

LF Power System Static Test

2. Objective

To provide information on the power system operation with resistive loads for comparison with compatibility test results. Compatibility tests are performed by substituting operational equipment for the resistive loads.

3. Description

3.1 Prerequisite: The LF Power subsystem will have been checked out per D2-7819, Volume 1 prior to performance of this test. The batteries will be fully charged per D2-7819. Record the battery voltages.

3.2 Open all breakers on rack 406.

3.3 Connect the resistive loads to the power system as shown in Figure 3.2.1.1-1.

3.4 Monitor 400 cycle voltage and phase at rack 406.

3.5 Monitor current, voltage, frequency and power factor at instrumentation selector per Figure 3.2.1.1-2.

3.6 Measure voltage and current at the LF contactor across the batteries.

3.7 While monitoring at the LF contactor for transients, close the breakers to the battery chargers. Photograph any transients observed.

3.8 Photograph ripple at the LF Contactor.

3.9 Close the breakers to the power supplies and associated loads and photograph transients.

3.10 Measure DC voltage and current output of the power supplies with a differential voltmeter. Measure AC ripple.

3.11 Close breakers to 400 cycle loads and photograph transients.

3.12 Measure voltage and current to 400 cycle loads.

3.13 Record battery voltages.

4. Equipment In Test

4.1 LF Power Group

4.2 LF M-G Set

4.3 LF Battery Chargers (5 and 60 amps)

4.4 LF Batteries

4.5 LF Distribution Box

4.6 Resistive Loads

4.7 LF Contactor

5. Test Equipment Required

5.1 Oscilloscope, Tektronics 545A

5.2 Plug-In-Unit, Tektronics Type CA

5.3 Frequency Discriminator, Figure 3.1.1.1-2.

5.4 Differential Voltmeter, Fluke 803

5.5 LF Instrumentation Assembly

5.6 Multimeter, Simpson 260

6. Data Requirements

Record all data in the Test Log. Include photographs in Test Log.

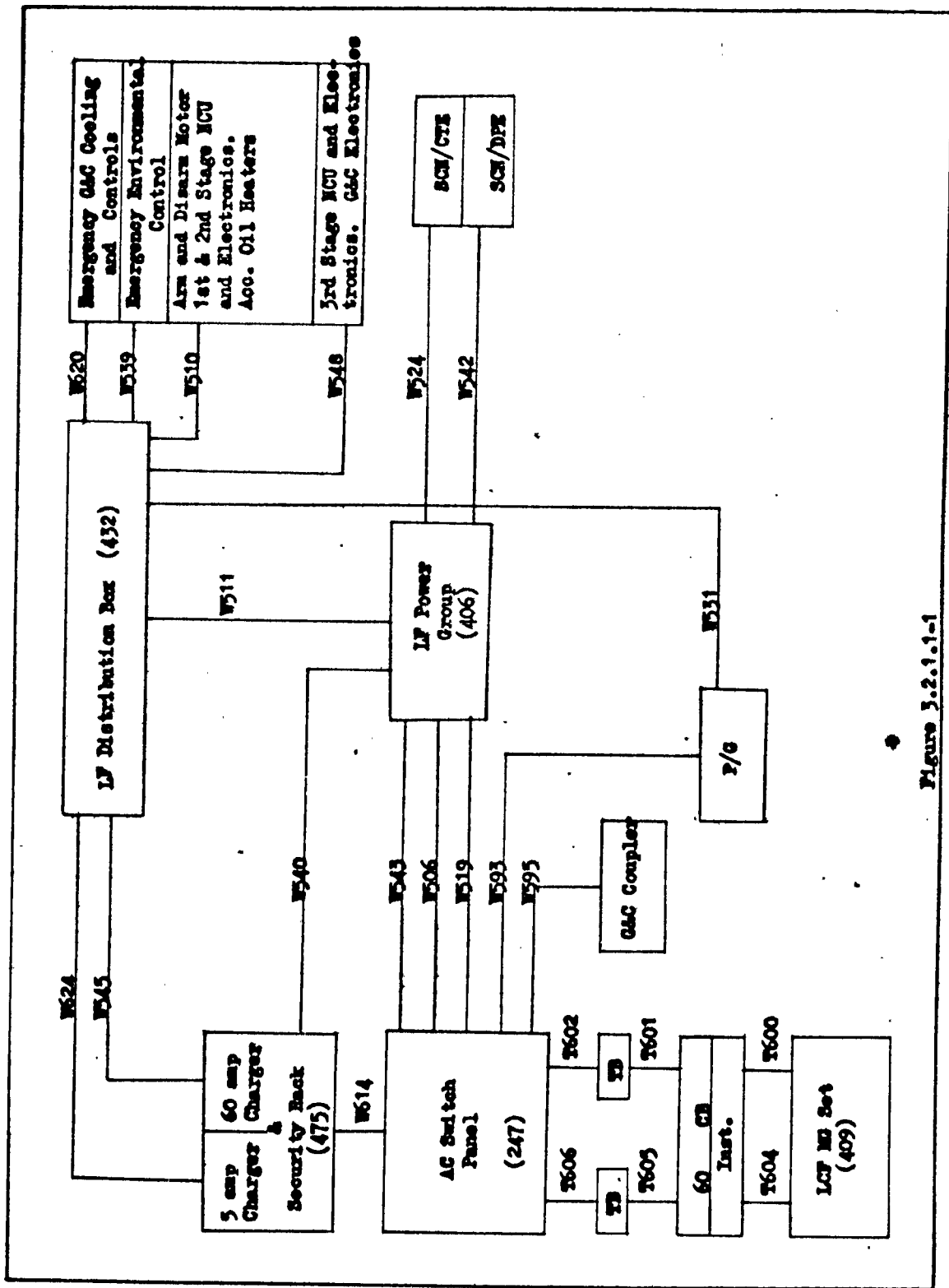


Figure 3.2.1.1-1

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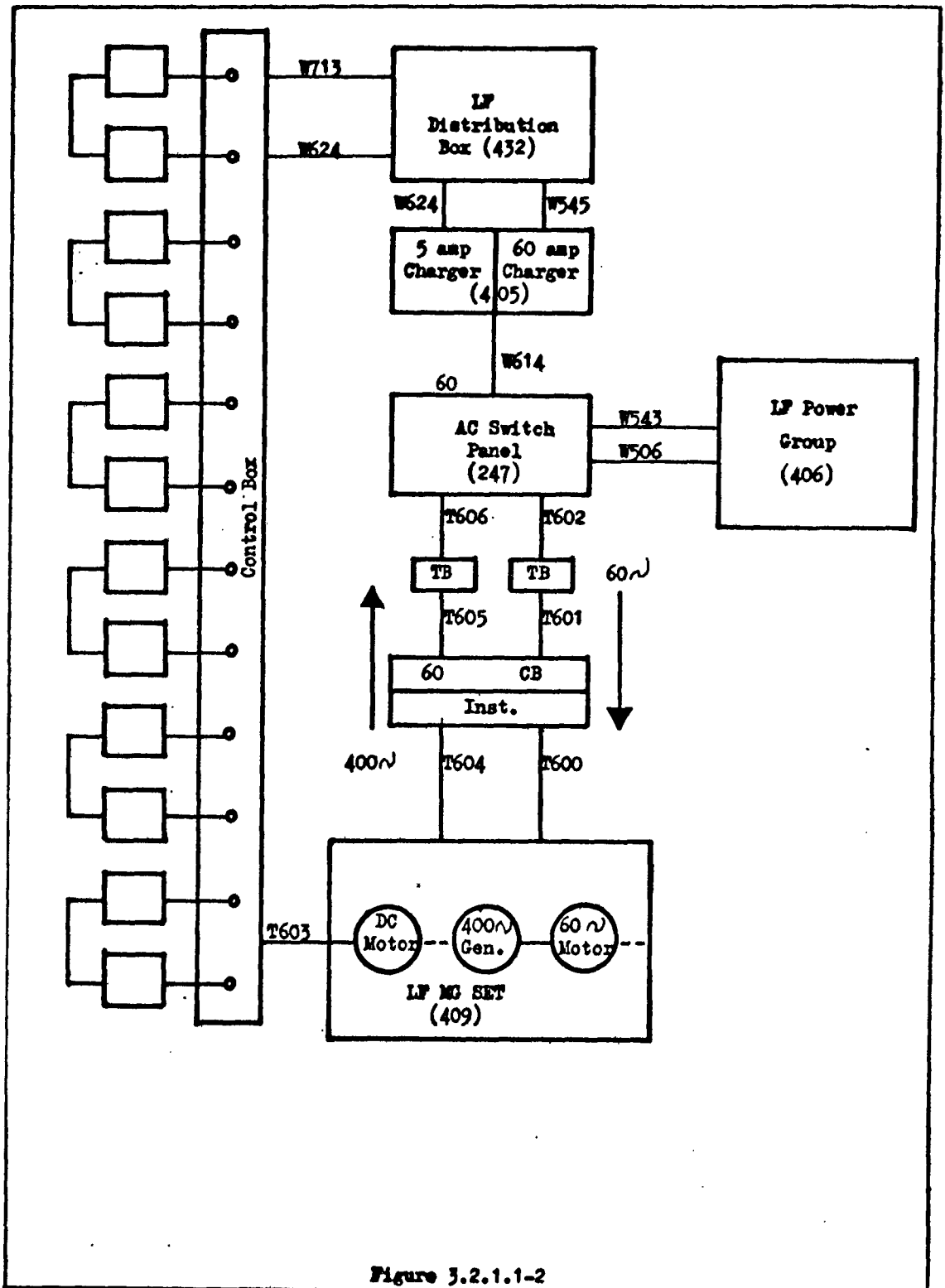


Figure J.2.1.1-2

TEST 3.2.1.2

1. Title

LF Load Test, SCN Equipment

2. Objectives

To determine the power requirements of the SCN for comparison with D2-4853 which shows 8.7 and 12.1 amperes peak for units 401 and 402, respectively. Power will be determined under conditions of initial turn-on at 55°F and warm-up of 2 hours.

3. Description

- 3.1 Connect the LF power system per Figure 3.2.1.1-1 except cables to J and J .
- 3.2 Verify that SCN breakers are open.
- 3.3 Determine rack exhaust temperature.
- 3.4 Connect cables per Figure 3.2.1.2-1, to the SCN equipment.
- 3.5 Verify that SCN breakers are open.
- 3.6 Close breakers at LF Power Group.
- 3.7 Measure voltage at entrance to Racks 401 and 402. Voltage should be 28.0 to 30.5 volts DC.
- 3.8 Close breaker at Rack 402.
- 3.9 Close breaker at Rack 401.
- 3.10 Record voltage and current at each end of cables W542 and W524.
- 3.11 Wait two hours, measure rack exhaust temperature and repeat measurements of 3.10.
- 3.12 Measure ripple at input to each rack. Photograph waveforms.
- 3.13 Trip breaker at Rack 401.

3.14 Measure ripple at Rack 402.

3.15 Trip breaker at Rack 402.

3.16 Measure ripple at cable to Rack 402.

3.17 Open primary DC breakers at LF Power Group.

3.18 Test Complete.

4. Equipment in Test

4.1 Digital Data Group (401)

4.2 Status Command Message Group (402)

4.3 LF Power Group (406)

4.4 Battery Charger - Alarm Set (475)

5. Test Equipment Required

5.1 Oscilloscope Tektronix 555.

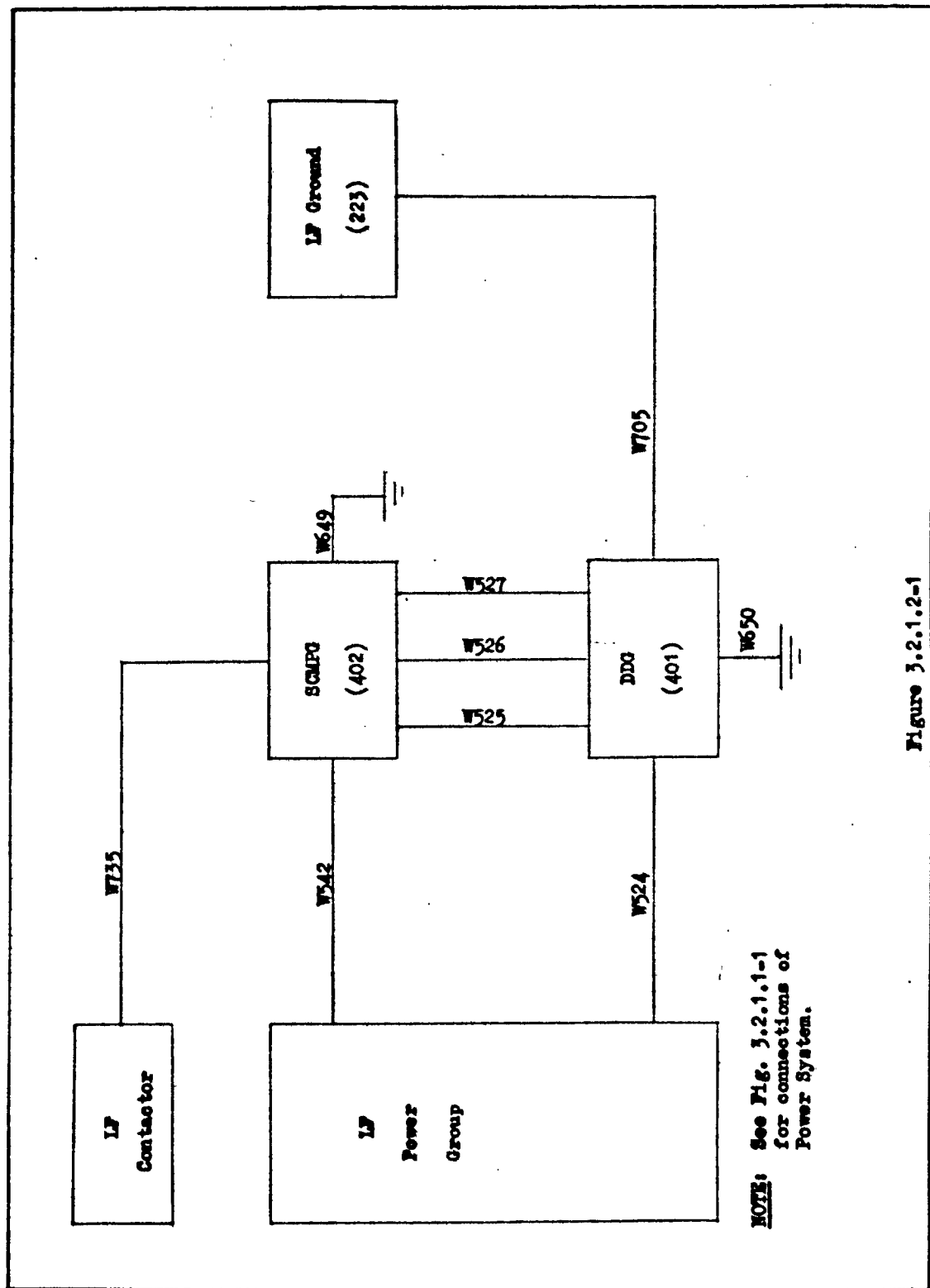
5.2 Preamps Tektronix D

5.3 Differential Voltmeter, Fluke 801 or 803.

5.4 Ammeters (2) 20 amps DC, 5%.

6. Data Requirements

Record all data and observations in the Test Log.



NOTE: See Fig. 3.2.1.1-1 for connections of Power System.

Figure 3.2.1.2-1

TEST 3.2.1.3

1. Title

LF Load Test, Programmer Group

2. Objectives

To determine the 400 cycle power requirements of the Programmer Group for comparison with D2-4853.

3. Description

3.1 Connect the LF Power System per Figure 3.2.1.1-1.

3.2 Connect the Programmer Group per Figure 3.2.1.3-1.

3.3 Close breaker on the LF Power Group. Verify Monitor Power On indicator lights on Programmer Group.

3.4 Measure Voltage, Current, Power, Frequency and Phase at input to P/G and input to LF Power Group.

3.5 Momentarily apply +28 V (500 ma) to J4 pin 16 referenced to J4 pin 17. The P/G Power On indicator shall light.

3.6 Repeat step 3.4.

3.7

4. Equipment in Test

LF Power Group (406)

Battery Charger - Alarm Set (475)

LF MG Set (409)

Programmer Group (403)

5. Test Equipment

5.1 LF Instrumentation, Figure 3.2.1.1-2.

5.2 Oscilloscope, Tektronix 545A.

5.3 Preamp. Tektronix - Type D.

5.4 Oscilloscope Camera

5.5 Differential Voltmeter Fluke 803.

5.6 Eput Meter, Berkeley

5.7 Battery, 28 volt.

5.8 Resistor, 1 ohm 2 watt.

6. Data Requirements

Record all data and observations in the Test Log.

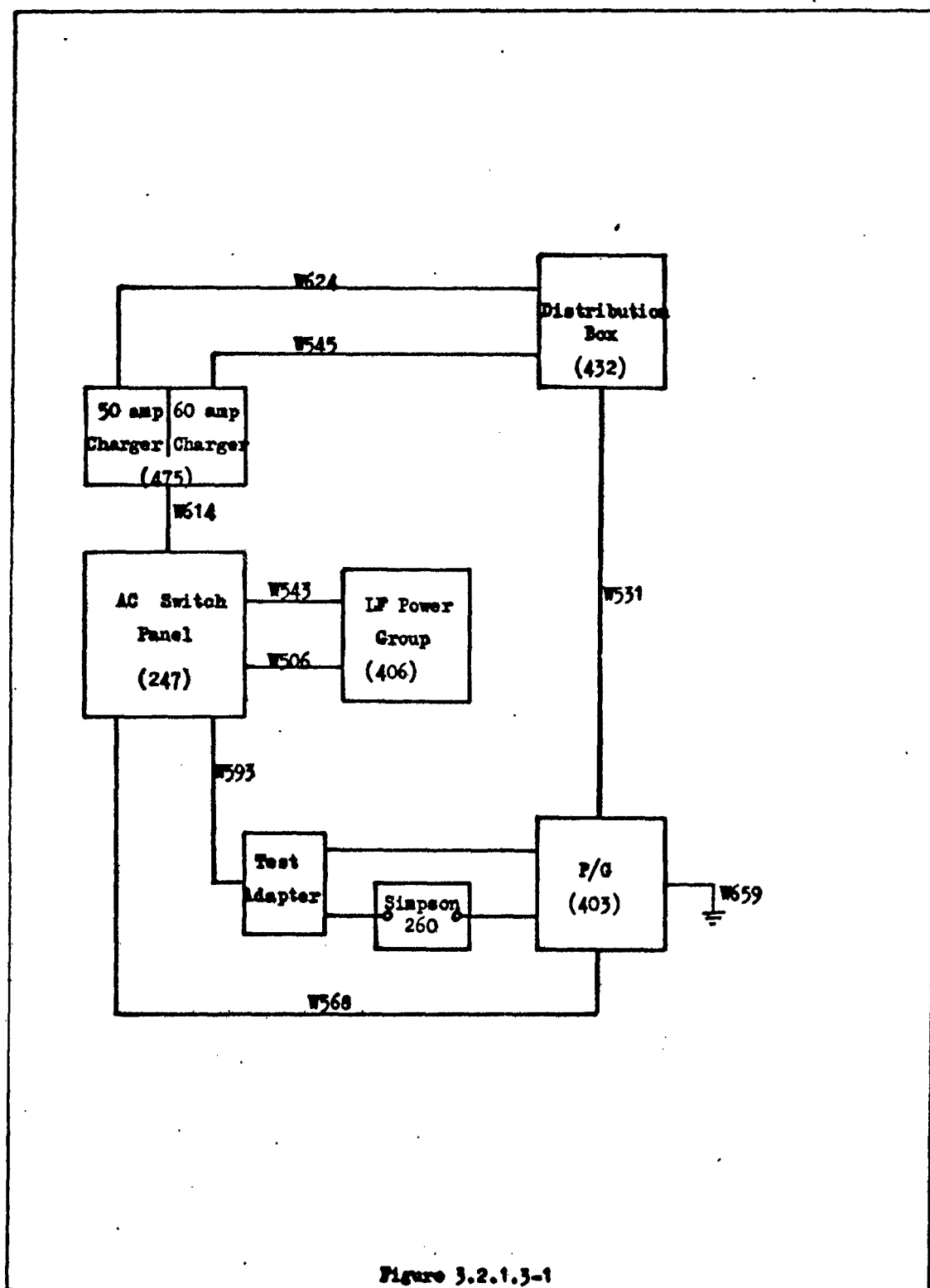


Figure 3.2.1.3-1



TEST 3.2.1.4

1. Title

LF Load Test, Safety Control Switch

2. Objectives

To determine the power requirements of the Safety Control Switch.

3. Description

3.1 Connect the LF power system per Figure 3.2.1.4-1.

3.2 Monitor current and voltage into the LF Distribution Box before and during Safing and Arming of the Safety Control Switch (SCS).

3.3 Determine transients on DC input to the Distribution Box by activating SCS.

3.4 Determine transients on W529 caused by SCS switch activation/de-activation.

3.5 Determine current on SCS Motor Control lines during activation.

3.6 Measure activation time (Secret).

4. Equipment in Test

4.1 LF Power Group (406)

4.2 Battery Charger -- Alarm Set (475)

4.3 LF M-G Set (409)

4.4 Programmer Group (403)

4.5 LF Distribution Box (432)

5. Test Equipment

5.1 Oscilloscope - Tektronix 545A

5.2 Preamplifier - Tektronix Types D and CA

3.3 Oscilloscope Camera

3.4 Multimeter - Simpson 260

6. Data Requirements

Record all data in the Test Log except time of SCS transfer (which is Secret).

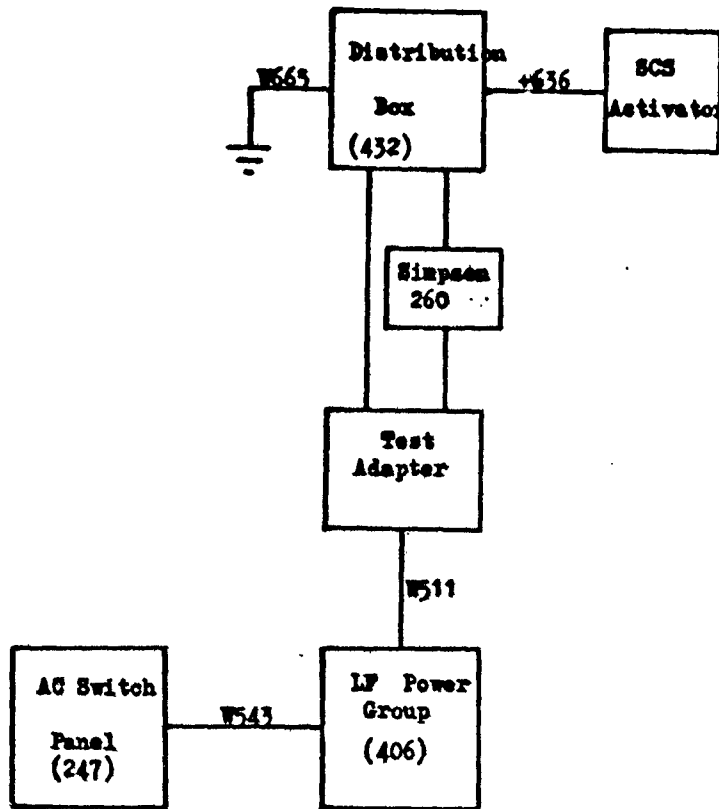


Figure 3.2.1.4

TEST 3.2.1.5

1. Title

LF Load Test, G&C Coupler

2. Objectives

To determine the power requirements of the G&C Coupler with D2-4853 which shows amperes at 400 cps 120/208.

3. Description

3.1 Connect the equipment per Figure 3.2.1.5-1, with cable W595 disconnected.

3.2 Verify that COUPLER POWER FROM LF POWER GROUP and LF POWER GROUP FROM MG SET indicator lamps on the AC Switch Panel are on.

3.3 Close CB2 on AC Switch Panel.

3.4 Verify that COUPLER ON lamp on AC Switch Panel is on.

3.5 Measure voltage at Coupler end of W595.

3.6 Open CB2 and connect cable W595.

3.7 Close CB2.

3.8 Reset any indicators which are on at the Coupler.

3.9 Measure current, voltage, power ripple, phase, frequency at instrumentation selector.

3.10 Test Complete.

4. Equipment in Test

G&C Coupler (412)

AC Switch Panel (247)

LF Power Group (406)

LF MG Set (409)

Battery Charger - Alarm Set (475)

MRA Cables W595, W506

5. Test Equipment Required

LF Instrumentation Panel (287) Figure 3.1.1.1-4.

6. Data Requirements

Record all data in the Test Log. Oscilloscope photographs of ripple are required.

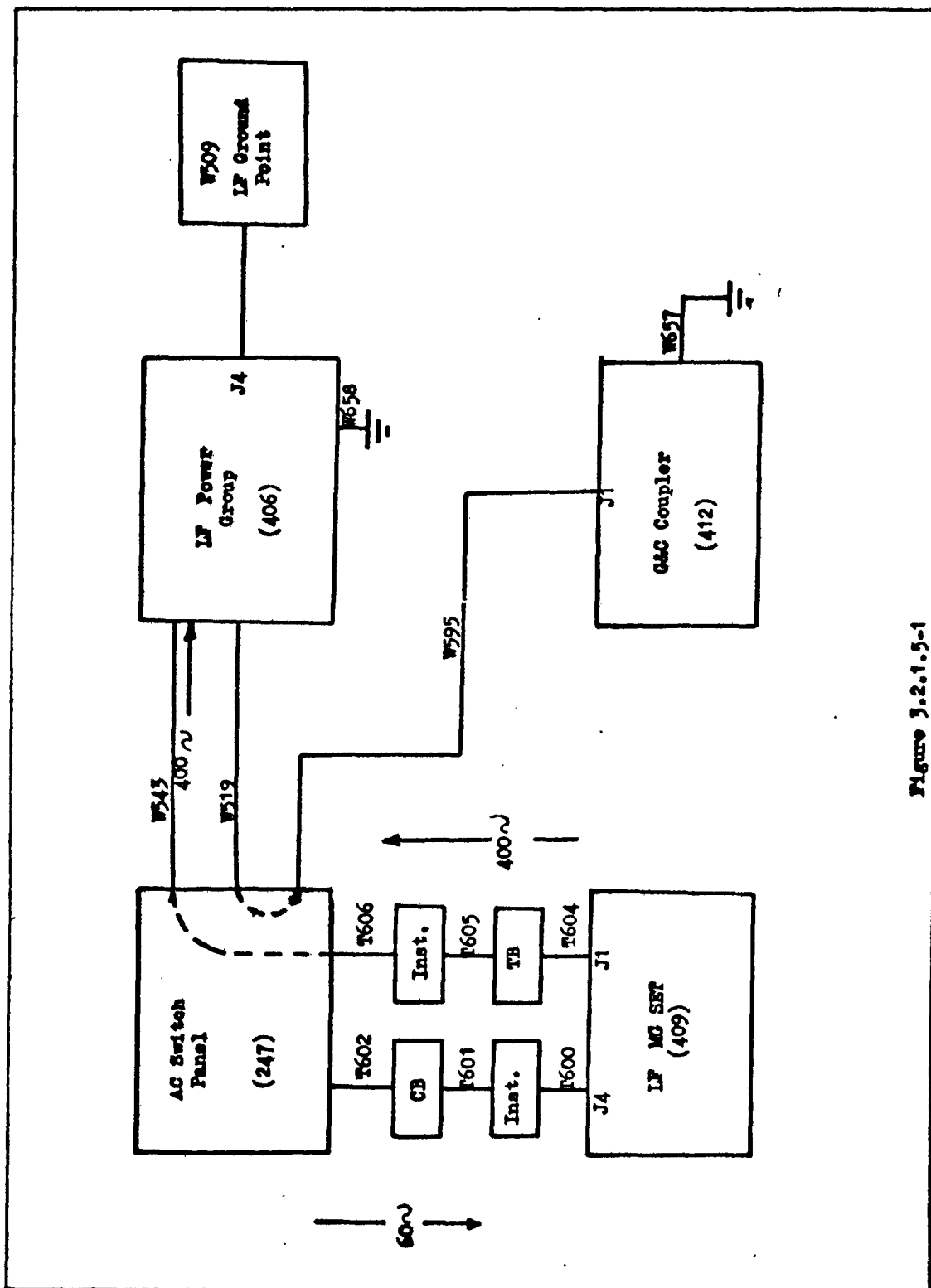


Figure 3.2.1.5-1

TEST 3.2.1.6

1. Title

LF Load Test, Repeater Telephone Set

2. Objectives

To determine the power requirements of the RTS with D2-4853 which shows 2.5 amps at 120 volts AC with a power factor of 0.8. To determine inrush current.

3. Description

3.1 Connect the equipment per Figure 3.2.1.6-1.

3.2 Turn on power measuring transient voltage and currents to rack.

3.3 Measure steady state voltage, current and power factor.

3.4 Apply 1000 cps 3 dbm tone through a mile AWG cable simulator for each receive line.

3.5 Apply a 100 cps dbm tone to the transmit and load the outputs with 470 ohms each.

3.6 Measure current, voltage and power factor.

4. Equipment in Test

Repeater Telephone Set (418)

5. Test Equipment Required

5.1 AC Ammeter 5 amp scale

5.2 Phase Meter Test Inst. 320 AB

5.3 Oscilloscope, Tektronix 545A.

5.4 Spt Meter, Berkeley

5.5 Multimeter, Simpson 260

5.6 RMS Voltmeter with DC output

5.7 NRA Recording System

5.8 Oscillator

6. Data Requirements

Record all measurements in the Test Log.

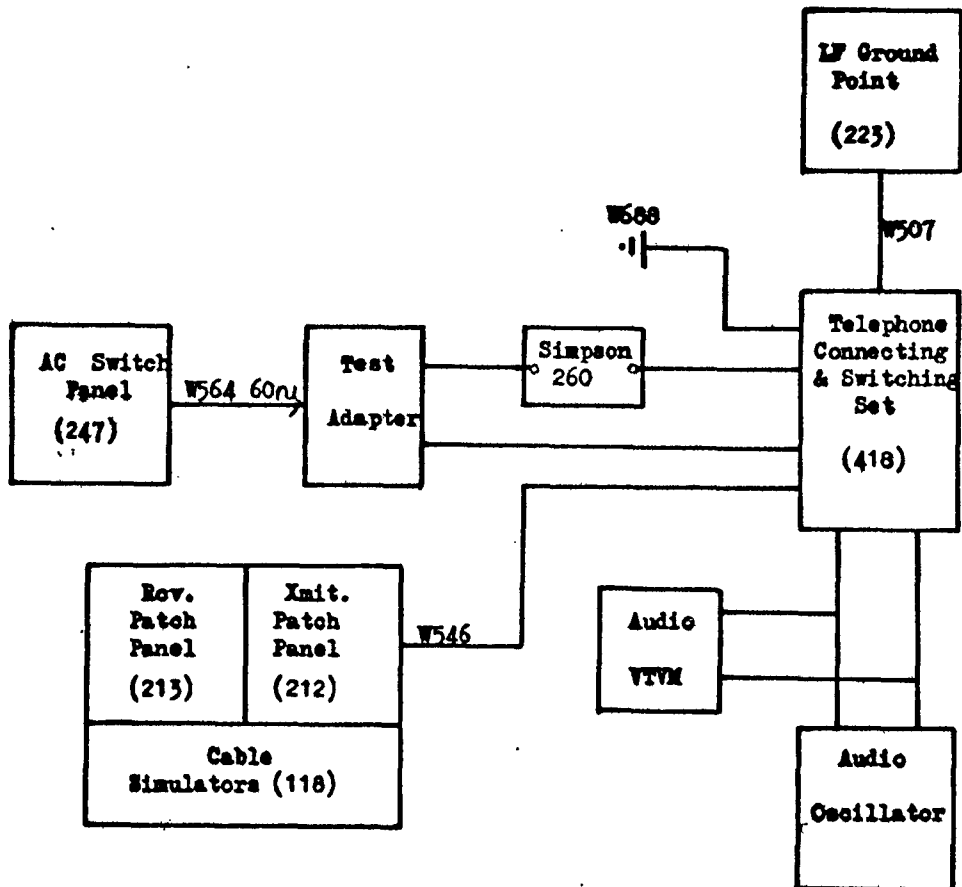


Figure 3.2.1.6-1



TEST 3.2.1.7

1. Title

LF Load Test, Volatile Decoder

2. Objectives

To determine the power requirements of the Volatile Decoder at the upper and lower voltage limits and to determine the voltage at which the code is dissipated.

3. Description

3.1 Insert an "all-ones" code into the decoder and determine current required to hold at 36 volts.

3.2 Adjust series resistance to drop voltage to 28 volts and measure current.

3.3 Determine voltage at which code is dissipated.

3.4 Repeat above steps for an "all-zeros" code.

4. Equipment in Test

Digital Data Group

LF Power Contactor Box (288)

SCN/DPE (402)

LF Batteries (255-266)

5. Test Equipment Required

5.1 Multimeter, Simpson 260

5.2 Variable Resistor

6. Data Requirements

Record all data in the Test Log.

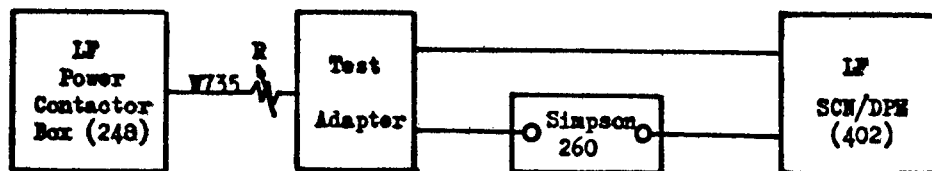


Figure 3.2.1.7-1



TEST 3.2.1.8

1. Title

LF Load Test, VESA

2. Objectives

To determine the power requirements and load characteristics of the VESA for comparison with D2-4853.

3. Description

3.1 Connect the equipment as shown in Figure 3.2.2.2-1 with instrumentation per Figure 3.2.1.8-1.

3.2 Start up the P/G and Coupler per Test 3.2.2.2, steps 3.1 to 3.23.

3.3 Measure the DC voltage, current and ripple at input to VESA.

3.4 Activate the VESA Interrogator and repeat measurements of 3.3.

4. Equipment in Test

LF Power Group

LF M-G Set

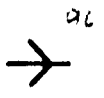
AC Switch Panel

Programmer Group

VESA

VESA Interrogator

LF Interface Simulator



5. Test Equipment Required

5.1 Oscilloscope, Tektronix 545A or 555

5.2 Preamps, Tektronix type D.

5.3 Oscilloscope Camera, Dumont 302

5.4 Differential Voltmeter, Fluke 801

5.5 Current Shunt, 5. amps

6. Data Requirements

Record all data in the Test Log. Oscilloscope photographs are required of ripple.

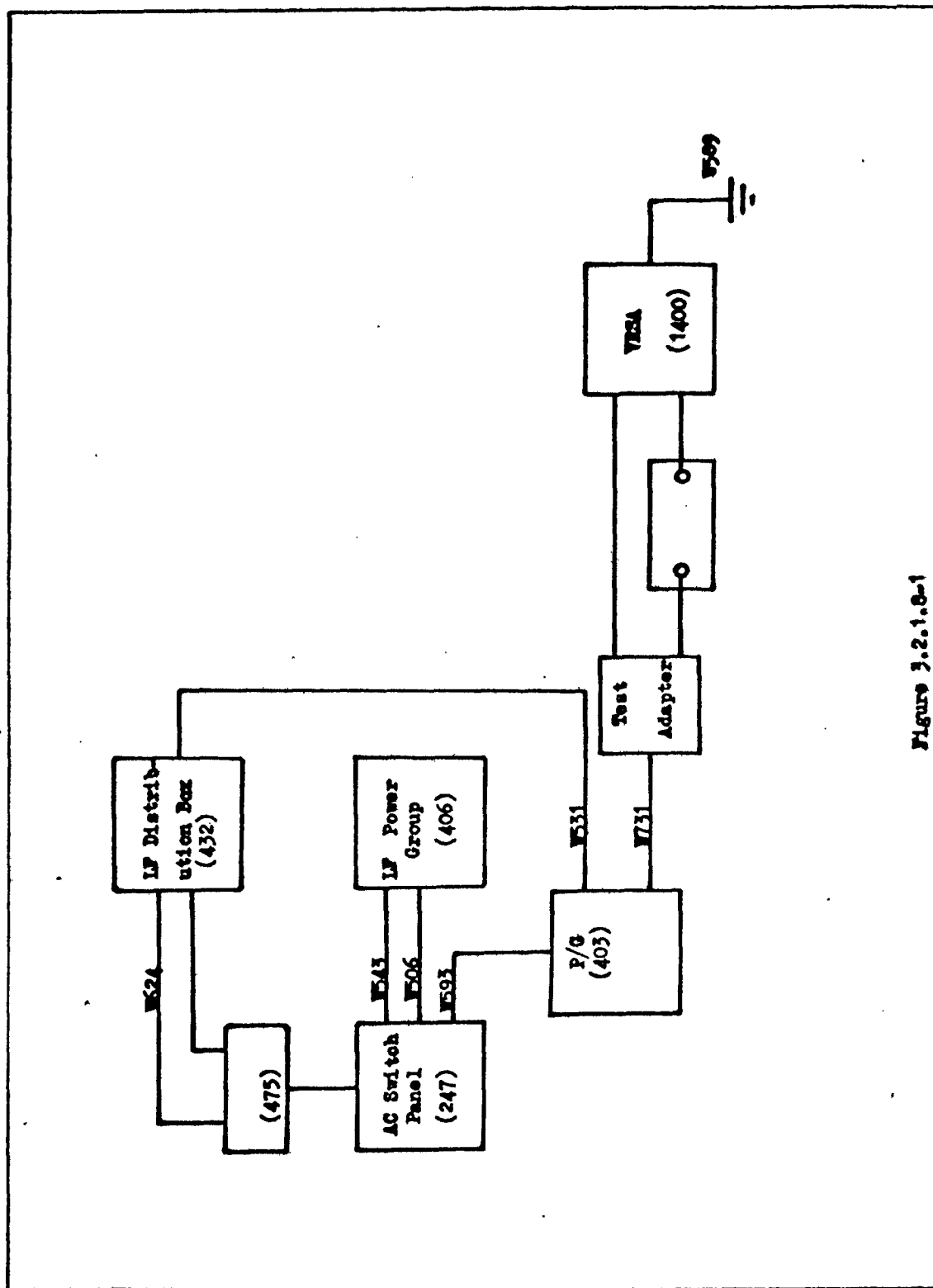


Figure 3.2.1.8-1

TEST 3.2.1.11

1. Title

LF Load Test, Alarm Set

2. Objectives

To determine the 400 cycle power requirements of the Alarm Set for comparison with D2-4853.

3. Description

3.1 Connect the Alarm Set per Figure 3.2.1.11-1.

3.2 Close breaker on the LF Power Group and verify the Alarm Set is activated.

3.3 Measure voltage, current, power, frequency and phase at the input to the Alarm Set.

3.4 Initiate inner and outer security commands and repeat 3.3.

4. Equipment In Test

4.1 a.c. Switch Panel (247)

4.2 LF Power Group (406)

4.3 Alarm Set (475)

4.4 Outer Security Rack (281)

4.5 Inner Security Rack (282)

4.6 Antenna Simulator (288)

4.7 LF MG Set

5. Test Equipment

5.1 LF Instrumentation 3.2.1.1-2.

5.2 Oscilloscope, Tektronics 545A

5.3 Preamp, Tektronics Type D

5.4 Differential voltmeter, Fluke 803

5.5 Oscilloscope Camera

5.6 Eput meter

6. Data Requirements

Record all data and observations in the Test Log.

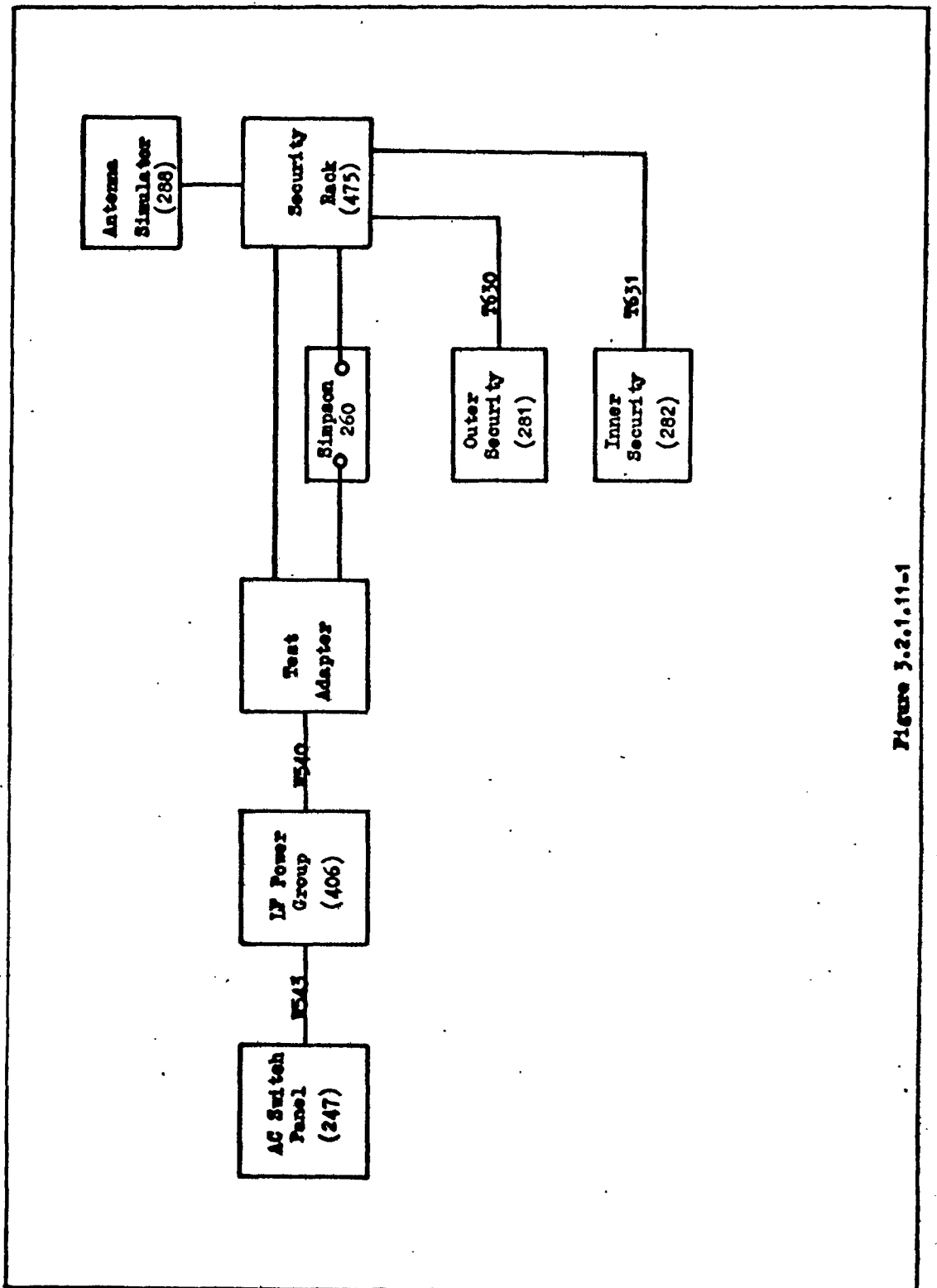


Figure 3.2.1.11-1



TEST 3.2.1.12

1. Title

LF Lead Test, P/G Ordnance

2. Objective

To determine the power requirements and load characteristics of the P/G Ordnance for comparison with D2-4853.

3. Description

3.1 Connect the equipment as shown in Figure 3.2.2.2-1 with instrumentation per Figure 3.2.1.12-1.

3.2 Start up the P/G and Coupler per Test 3.2.2.2, steps 3.1 to 3.23.

3.3 Measure the DC voltage, current and ripple at the input to the P/G.

3.4 Determine combinations of functions producing maximum current and repeat 3.3.

4. Equipment In Test

4.1 Program Group (403)

4.2 LF Distribution Box (432)

4.3 LF Power Group (406)

4.4 LF MG Set (409)

4.5 Battery Charger Set (475)

4.6 AC Switch Panel (247)

5. Test Equipment Required

5.1 Oscilloscope, Tektronix 545A

5.2 Preamps, Tektronix Type D

5.3 Oscilloscope Camera

5.4 Differential Voltmeter, Fluke 801

5.5 Multimeter, Simpson 260

6. Data Requirements

Record all data in the Test Log. Oscilloscope photographs are required for ripple.

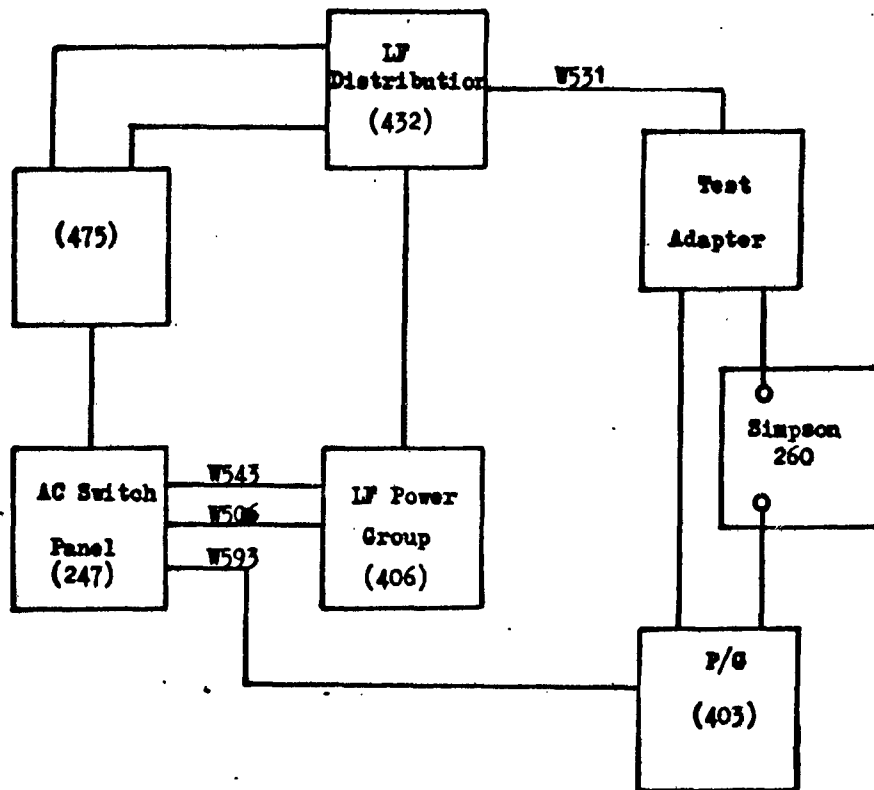


Figure 3.2.1.12-1



TEST 3.2.2.1

1. Title

Programmer Group and Coupler Start-up on Lab Power.

2. Objective

To establish a start up procedure when operating the Programmer Group (P/G) and Coupler on the facility 400V power.

3. Description

- 3.1 Open all breakers at AC Switch Panel (247) and Perkins Power Supply.
- 3.2 Connect the equipment per Figure 3.2.2.1-1.
- 3.3 Insert the Dummy Decoder into the P/G.
- 3.4 Place all switches on Launcher Auxiliary Simulator (251), Missile Simulator (279 and 254), LF Interface Simulator (291), Startup Unit (280) and Coupler Test Set (290) in the OFF or NORMAL position.
- 3.5 Verify that P/G ON FACILITY POWER lamp at AC Switch Panel is on.
- 3.6 Verify that COUPLER ON FACILITY POWER lamp at AC Switch Panel is on.
- 3.7 Verify Cooling on and Cooling Safe Unit (154) on.
- 3.8 Verify that MAIN POWER CONTROL lamp at AC Switch Panel is on. If necessary, press RESET button. If the cooling was off, it may be necessary to first press the RESET button on the Cooling Safe Unit.
- 3.9 Verify that EMERGENCY POWER TEST lamp on AC Switch Panel is off. If on, manually trip relay K6 in AC Switch Panel.

CAUTION: Dangerous voltages are present in the proximity of this relay.

- 3.10 Verify that POWER TEST OVERRIDE lamp on AC Switch Panel is off. If on, operate S11 to remove. Set S14 to the ON position.
- 3.11 POWER TEST lamp on AC Switch Panel should be off.
- 3.12 Place Startup Unit DISABLE DISCRETE TRUE switch on.
- 3.13 Place the Startup Unit HALT PRIME switch on.
- 3.14 Place the LF Interface Simulator MANUAL/LCF switch to the LCF position.
- 3.15 Place the Startup Unit REMOTE/LOCAL switch in the REMOTE position.
- 3.16 Close breakers to P/G and Coupler at the AC Switch Panel. Close breaker at the Perkins and push Reset. The indicators for each phase of the P/G power will come on at the AC Switch Panel. The MONITOR POWER ON lamp at the P/G shall light. G&C Electronics and Accelerometer Oil Heater lamp shall illuminate at AC Switch Panel.
- 3.17 Turn on POWER switch at Start-up Unit. The G&C Temperature-in-Tolerance lamp shall illuminate.
- 3.18 Place Missile Downstage & Auxiliary Silo Simulator POWER switch on.
- 3.19 Place LF Interface Simulator POWER switch on.
- 3.20 Place LF Interface Simulator LCF/MANUAL switch to MANUAL.
- 3.21 Place REMOTE/LOCAL switch on the Startup Unit in the LOCAL position.
- 3.22 Place the Coupler Test Set POWER switch on. If malfunction lamps are on, depress the MALFUNCTION RESET.
- 3.23 Depress SHUT DOWN SITE switch at the P/G. The NO-GO lamp on the Startup Unit shall come on.
- 3.24 Depress the NO-GO RESET button at the P/G. The NO-GO lamp on the Startup Unit shall go out.
- 3.25 Start Instrumentation.

3.26 Depress P/G and Coupler POWER ON switch at the Startup Unit. COUPLER ON lamp at the AC Switch Panel shall light. Power lamps at the G&C Coupler shall come on. The COUPLER 400 lamps at the AC Switch Panel shall light.

3.27 Depress the G&C SYSTEM POWER ON switch at the Startup Unit. The G&C SYSTEM ON lamp shall light at the Startup Unit. The GUIDANCE ELECTRONICS lamp shall light at the Missile Downstage Simulator.

3.28 Turn off HALT PRIME switch at the Startup Unit.

3.29 Turn off DISABLE DISCRETE TRUE switch at the Startup Unit and the Timer Speed-up Inhibit switch to the OFF position.

(a) The DISABLE DISCRETES TRUE lamps at the Startup Unit and the Coupler Test Set shall be off. The Startup Unit ALIGNMENT IN PROCESS lamp shall come on.

(b) At 6 min. 10 sec. the Startup Unit TEST IN PROCESS lamp shall come on.

(c) At 6 min. 40 sec. the Startup Unit ALIGNMENT IN PROCESS lamp shall extinguish.

(d) At 6 min. 58 sec. the Startup Unit ALIGNMENT IN PROCESS and START CALIBRATE lamps shall come on.

(e) At 7 min. 10 sec. the Startup Unit TEST IN PROCESS lamp shall go off.

(f) At 8 min. depress the CALIBRATE button on the Startup Unit.

The ALIGNMENT IN PROCESS and START CALIBRATE lamps shall go out.

The CALIBRATE IN PROCESS lamp shall come on.

(g) At 28 min. the CALIBRATE IN PROCESS lamps at the Startup Unit and the Coupler Test Set shall go out. The STRATEGIC ALERT lamp at the Startup Unit shall come on.

3.30 To reach STRATEGIC ALERT without performing step 3.28b thru 3.28g, perform the following steps:

- (a) Make PROGRAM ADVANCE switch on the Coupler Test Set true.
- (b) Make PROGRAM ADVANCE false when TEST IN PROCESS lamp comes on at the Startup Unit.
- (c) Press CALIBRATE button at Startup Unit when the TEST IN PROCESS lamp extinguishes.
- (d) Make PROGRAM ADVANCE true.
- (e) STRATEGIC ALERT will come true.
- (f) Make PROGRAM ADVANCE false.

3.31 Test Complete.

4. Equipment in Test

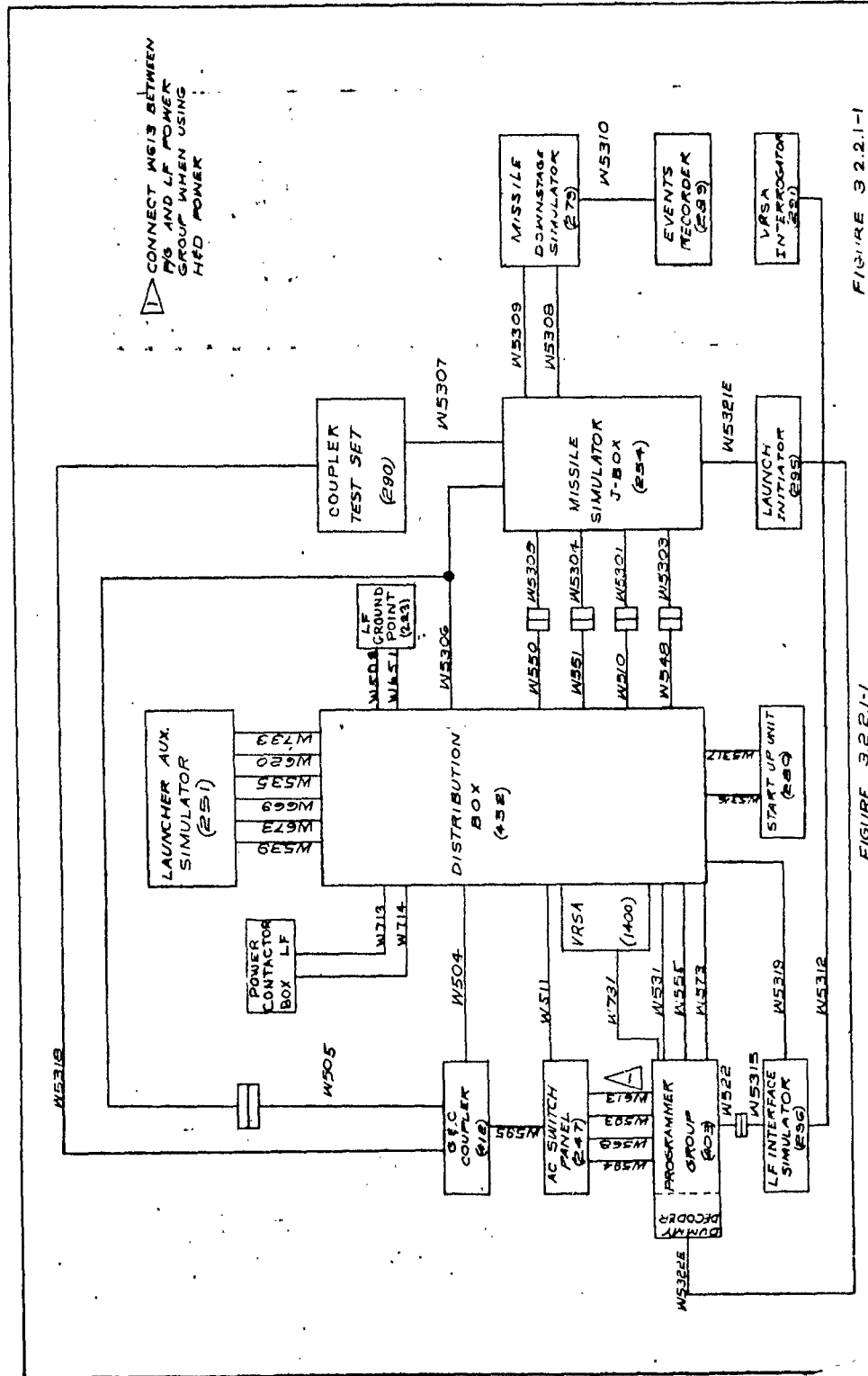
Refer to Figure 3.2.2.1-1.

5. Test Equipment Required

None

6. Data Requirements

Record performance of each step in the Test Log. Note the occurrence of any observations which are not indicated in the procedure.



TEST 3.2.2.2

1. Title

Programmer Group and Coupler Startup on LF Power System.

2. Objectives

To establish a startup procedure when operating the P/G and Coupler on the LF Power Subsystem.

3. Description

- 3.1 Open the breakers to the P/G and Coupler at the AC Switch Panel.
- 3.2 Connect the equipment per Figure 3.2.2.2-1 using power system per Figure 3.2.1.1-2.
- 3.3 Insert the Dummy Decoder into the P/G.
- 3.4 Place all switches on Launcher Auxiliary Simulator (251), Missile Simulator (279 and 254), LF Interface Simulator (291), Startup Unit (280) and Coupler Test Set (290) in the OFF or NORMAL position.
- 3.5 Verify that P/G ON LF POWER GROUP and COUPLER ON LF POWER GROUP lamps at the AC Switch Panel are on.
- 3.6 Verify that LF POWER GROUP ON M-G SET lamp at the AC Switch Panel is on.
- 3.7 Verify that Cooling is on and COOLING SAFE lamp is on.
- 3.8 Verify that MAIN POWER CONTROL lamp at AC Switch Panel is on. If necessary, press RESET button. If the cooling was off, it may be necessary to first press the RESET button on the Cooling Safe Unit.

3.9 Verify that EMERGENCY POWER TEST lamp on AC Switch Panel is off.

If on, manually trip relay K6 in AC Switch Panel.

CAUTION: Dangerous voltages are present in the proximity of this relay.

3.10 Verify that POWER TEST OVERRIDE lamp on AC Switch Panel is off.

If on, operate S11 to remove.

3.11 POWER TEST lamp on AC Switch Panel should be off.

3.12 Place Startup Unit DISABLE DISCRETE TRUE switch on.

3.13 Place the Startup Unit HALT PRIME switch on.

3.14 Place the LF Interface Simulator MANUAL/LCF switch in the LCF position.

3.15 Place the Startup Unit REMOTE/LOCAL switch in the REMOTE position.

3.16 Close all breakers at the LF Power Group.

3.17 Close breaker CB1 to P/G and CB2 to Coupler at AC Switch Panel.

Verify that indicators for each phase come on. MONITOR POWER ON lamp at P/G shall light.

3.18 Turn on POWER switch at Startup Unit and switch to LOCAL control.

3.19 Place Missile Downstage and Auxiliary Silo Simulator POWER switch on.

3.20 Place LF Interface Simulator POWER switch on.

3.21 Place MANUAL/LCF switch on the LF Interface Simulator in the MANUAL position.

3.22 Place the Coupler Test Set POWER switch on. If malfunction lamps are on, depress the MALFUNCTION RESET.

3.23 Depress the SHUT-DOWN SITE switch at the P/G. The No-Go lamp on the Startup Unit shall come on.

3.24 Depress the NO-GO RESET button at the P/G. The No-Go lamp at the Startup Unit shall go out.



3.25 Start the system up to Strategic Alert per Test 3.2.1.1.

4. Equipment in Test

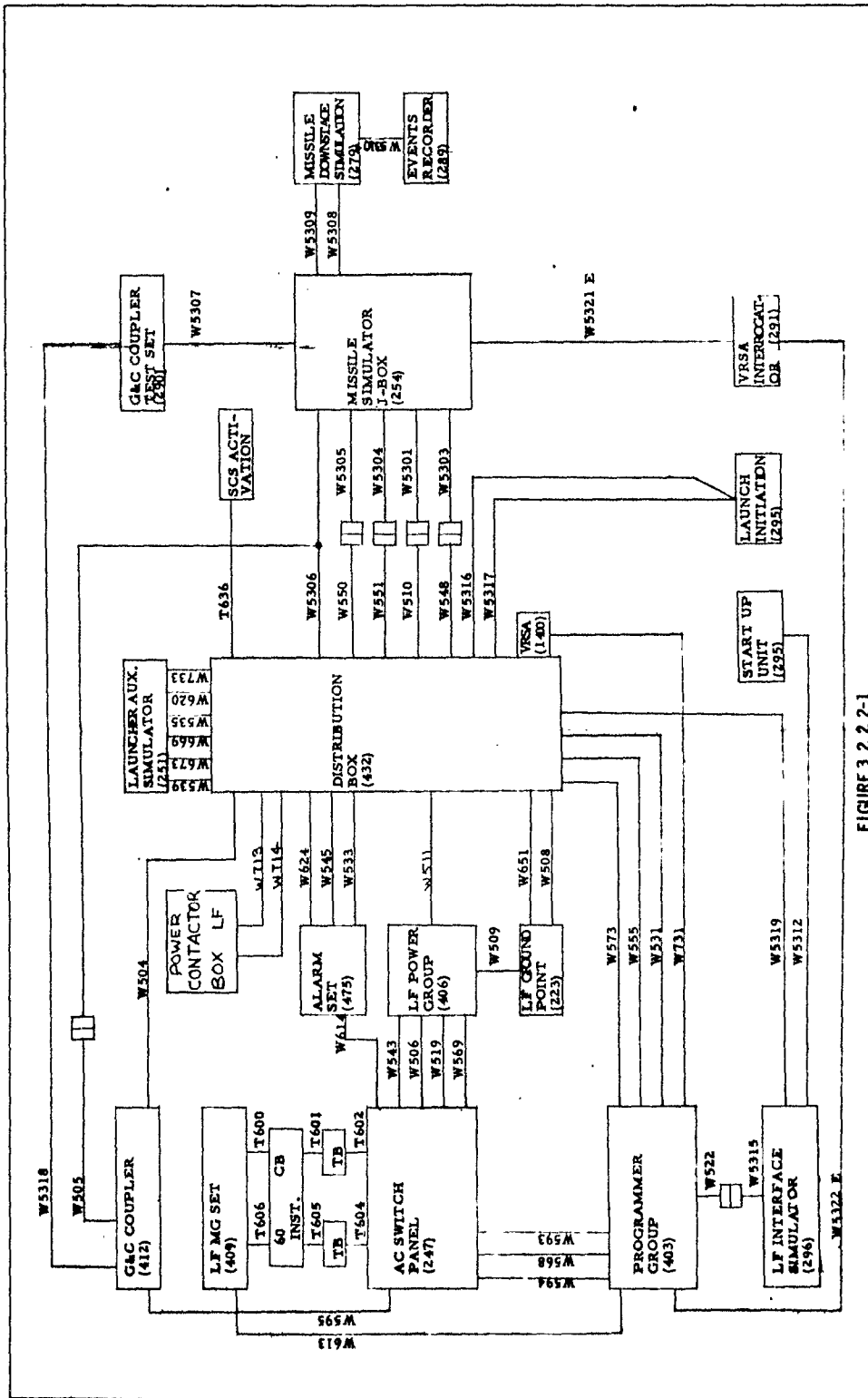
Refer to Figure 3.2.2.2-1.

5. Test Equipment Required

None.

6. Data Requirements

Record performance of each step in the Test Log. Note the occurrence of any observations which are not indicated in this procedure.



TEST 3.2.2.3

1. Title

P/G and Coupler with H&D Power, VRSA Alarms and No-Go's.

2. Objective

To verify compatibility of the P/G and Coupler with the H&D Power Subsystem.


3. Description

3.1 Start up the P/G and Coupler per Test 3.2.2.2.

3.2 Perform the Alarm and No-Go tests by actuating the appropriate switches listed below and interrogating VRSA after the Alarm or No-Go lamps illuminate. Restart the system per Test 3.2.2.2 for No-Go shut-downs.

<u>Switch</u>	<u>Location</u>
(a) Primary Power Alarm	Turn off 60~ to MG Set
(b) Launch Tube Flood Alarm	Launcher Aux. Simulator
(c) Launcher Temperature Alarm	↕
(d) Equip. Inlet Air Humidity Alarm	
(e) Equip. Inlet Air Temp. & Flow Alarm	Turn off 60~ to MG Set
(f) G&C Compartment Temp. Alarm	Launcher Aux. Simulator
(g) SCN Alarm #1 (LSU Fault)	LF Interface Simulator
(h) SCN Alarm #2 (LEU Fault)	↕
(i) SCN Alarm #3 (MD Fault)	
(j) SCN Alarm #4 (Retransmission Failure)	
	LF Interface Simulator



<u>Switch</u>	<u>Location</u>
(k) SCN Alarm #5 (Loss of Tone)	LF Interface Simulator
(l) SCN Alarm #6 (Command Network Fault)	LF Interface Simulator
(m) Seismic Alarm	G&C Test Set
(n) Autocollimator Alarm AC #1 & AC #2	G&C Test Set
(o) Ord. Devices Safe Inhibit No-Go	Missile Downstage Simulator
(p) Warhead No-Go	
(q) R/V Arming and Fusing No-Go	
(r) G&C Compartment Temperature No-Go	Missile Downstage Simulator
(s) 400 cycle Power Failure	AC Switch Panel
(t) P/G Shut-down	Programmer Group

4. Equipment in Test

Refer to Figure 3.2.2.2-1.

5. Test Equipment Required

MRA Instrumentation System

6. Data Requirements

Record tapes at 60 ips. Play back at 7.5 ips onto the oscillograph while recording at 1 ips. Permanent records will be made of selected signals. The tape channels will be connected to the following:

TABLE No. 3.2.2.3-1

Tape Channel No.	Gain	DC/AC	Signal Monitor Point	Signal Characteristics	Occ. Scale V/In.
1			J7-2 J7-1	Primary Power Alarm	
2			J1-7 J5-1 thru 4	Alarm	
3			J3-1 J3-73	VRSA Primary Power Fault	
4			J3-2 J3-73	VRSA Primary Power Not Fault	
5			J3-89 J3-98	VRSA Remote Reset	
6			J3-73 J3-97 & 99	VRSA Primary Power	
7			J3-9 J3-10	VRSA Emergency Power	
8			J3-84 J3-96	VRSA Interrogate	
9			J1-27 J1-28	Remote VRSA Output	
10			J2-82 J2-83	W/H Safe	
11			J4-34 J4-35	G&C System Off (Monitor)	
12			J1-5 J5-1 thru 4	No-Go	
13				Voice	
14				80 cps Time Code	

TEST 3.2.2.4

1. Title

P/G and Coupler with H&D Power, Test Sequence from Strategic Alert.

2. Objectives

To verify compatibility of the P/G and Coupler with the H&D Power Subsystem.

3. Description

3.1 Start up the system to STRATEGIC ALERT per Test 3.2.2.2.

3.2 Perform the SEQUENCE TEST by depressing the Test Command button on the Startup Unit.

4. Equipment in Test

Refer to Figures 3.2.2.2-1 and

5. Test Equipment Required

MRA Instrumentation System

6. Data Requirements

Record tapes at 60 ips. Play back at 7.5 ips onto the oscillograph while recording at 1 ips. Permanent records will be made of selected signals. The tape channels will be connected to the following:

TABLE No. 3.2.2.4-1

Tape Channel No.	Gain	DC/AC	Signal Monitor Point	Signal Characteristics	Osc. Scale V/In.
1			J2-35 J5-1 thru 4	Local Control	
2			J1-12 J5-1 thru 4	Test	
3			J2-37 J5-1 thru 4	Test Command	
4			J2-2 J5-1 thru 4	Self-Test in Process	
5			J2-10 J5-1 thru 4	G&C Test in Process	
6			J7-2 J7-1	Primary Power Alarm	
7			J2-3 J5-1 thru 4	Pre-Alert	
8			J2-4 J5-1 thru 4	P/G Timing	
9			J4-16 J4-17	P/G Power On Command	
10			J4-34 J4-35	G&C System Off	
11			J1-2 J5-1 thru 4	Strategic Alert	
12			J1-3 J5-1 thru 4	Test Sequence in Process	
13				Voice	
14				80 cps Time Code	

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TABLE No. 3.2.2.4-1

Tape Channel No.	Gain	DC/AC	Signal Monitor Point	Signal Characteristics	Osc. Scale V/In.
1			J2-26 J5-1 thru 4	Test in Process	
2			J4-25 J4-26	NCU & Electronics Power On	
3			J10-5 J10-9	Transfer to Emergency Power	
4			J1-5 J5-1 thru 4	No-Go	
5			J10-10 J10-9	Transfer to Primary Power	
6			J4-68 J4-75	Ignite 1st Stage Engine (Ign. #1)	
7			J4-68 J4-75	Ignite 1st Stage Engine (Ign. #2)	
8					
9					
10					
11					
12					
13				Voice	
14				EO ops Time Code	



TEST 3.2.2.3

1. Title

P/G and Coupler with H&D Power, Calibrate Sequences.

2. Objectives

To verify compatibility of the P/G and Coupler with the H&D Power Subsystem.

3. Description

3.1 Start up the P/G and Coupler per Test 3.2.2.2.

3.2 Place system into STRATEGIC ALERT per 3.2.9, per Test 3.2.2.2.

3.3 Perform the CALIBRATE SEQUENCE by depressing the Calibrate Command button on the Start-up Unit.

4. Equipment in Test

Refer to Figures 3.2.2.2-1 and

5. Test Equipment Required

MRA Instrumentation System

6. Data Requirements

Record tapes at 7.5 ips. Play back at 7.5 ips onto the oscillograph at 0.64 ips. Permanent records will be made of selected signals. The tape channels will be connected to the following:

TABLE No. 3.2.2.5-1

Tape Channel No.	Gain	DC/AC	Signal Monitor Point	Signal Characteristics	Osc. Scale V/In.
1			J1-13 J5-1 thru 4	Calibrate	
2			J2-35 J5-1 thru 4	Local Control	
3			J2-18 J5-1 thru 4	Coupler Alarm	
4			J2-16 J5-1 thru 4	Autocollimator Alarm	
5			J2-36 J5-1 thru 4	Calibrate Command	
6			J2-7 J5-1 thru 4	Calibration in Process	
7			J4-34 J4-35	G&C System Off	
8			J4-16 J4-17	P/G Power On Command	
9			J2-29 J5-1 thru 4	Strategic Alert	
10			J2-31 J5-1 thru 4	No-Go	
11			J1-4 J5-1 thru 4	Calibrate Sequence in Process	
12			J2-28 J5-1 thru 4	Calibration in Process	
13				Voice	
14				80 cps Time Code	

TEST 3.2.2.6

1. Title

P/G and Coupler with H&D Power, Pre-Alert No-Go's, Sequence Errors, Test and Calibrate Tests.

2. Objectives

3.1 Start up P/G and Coupler per Test 3.2.2.2 to obtain Alignment Mode.

3.2 Initiate No-Go's per Test 3.2.2.3, and observe shut-downs.

3.3 Place the system into the Alignment Mode. Place the Confirm Codes Error switch at the G&C Test Set to TEST until the G&C Error lamp at the G&C Test Set illuminates, then place to the NORM position.

3.4 Repeat 3.3 for the following Sequence Errors at the G&C Test Set:

(a) Parity Error

(b) Downstage No-Go

(c) Sequence Advance Error

3.5 Place the system into the Test Mode per 3.2.2.2, paragraph 3.29.

Place the Confirm Codes Error switch to TEST until the G&C Error lamp illuminates, then place to the NORM position. Start up system per 3.2.2.2.

3.6 Repeat 3.5 for the following Sequence Errors:

(a) Parity Error

(b) Downstage No-Go

3.7 Place the system into the Test Mode per 3.2.2.2, paragraph 3.29.

When NCU and Electronics Power On lamps at the Missile Downstage Simulator illuminate, place the Confirm Codes Error switch to TEST until the G&C Error lamp illuminates, then place to the NORM position.

3.8 Repeat 3.5 for the following Sequence Errors:

- (a) Parity Error
- (b) Downstage No-Go
- (c) Sequence Advance Error

3.9 Place the system into the Calibrate Mode per 3.2.2.2, paragraph 3.29.

Place the Confirm Codes Error switch to TEST until the G&C Error lamp illuminates, then place to the NORM position.

3.10 Repeat 3.9 for the following Sequence Errors:

- (a) Parity Error
- (b) Downstage No-Go
- (c) Sequence Advance Error

3.11 Place the system into the Alignment Mode and initiate a Test Command from the Startup Unit and LF Interface Simulator.

3.12 Repeat 3.11 for Calibrate Command.

3.13 Place the system into the Test Mode and initiate a Test Command from the Startup Unit and LF Interface Simulator.

3.14 Repeat 3.13 for Calibrate Command.

3.15 Place the system into the Calibrate Mode and initiate a Test Command from the Startup Unit and LF Interface Simulator.

3.16 Repeat 3.15 for Calibrate Command.

(a) Test Sequence recorded channels per Table 3.2.2.4-1.

(b) Calibrate Sequence recorded channels per Table 3.2.2.5-1.

(c) Launch Sequence recorded channels per Table 3.2.2.6-1.

4. Equipment in Test

Refer to Figure 3.2.2.2-1.

5. Test Equipment Required

MRA Instrumentation System.

6. Data Requirements

Record tapes at 60 ips. Playback at 7.5 ips onto the oscillograph while recording at 1 ips. Permanent records will be made of selected signals.

TEST 3.2.2.7

1. Title

P/G and Coupler with H&D Power, Emergency Alert tests.

2. Objectives

To verify compatibility of the P/G and Coupler with the H&D Power Subsystem.

3. Description

3.1 Start up the P/G and Coupler per Test 3.2.2.2.

3.2 Place the system into Strategic Alert per 3.29.

3.3 Place the Speedup Inhibit switch at the Missile Simulator J-Box and AC #1 and AC #2 switches at the G&O Test Set to the ON position.

3.4 Perform the following Emergency Alert tests:

(a) Test Sequence per Test 3.2.2.4:

(b) Calibrate Sequence per Test 3.2.2.5. (Speedup Inhibit switch OFF).

(c) Launch Sequence per Test 3.2.2.8.

(d) No-Go Shut-down after 45 minutes with Speedup Inhibit switch OFF.

4. Equipment in Test

Refer to Figures 3.2.2.2-1 and

5. Test Equipment Required

MRA Instrumentation System

6. Data Requirements

Record tapes at 60 ips. Play back at 7.5 ips onto the oscillograph while recording at 1 ips. Permanent records will be made of selected signals. The tape channels will be connected to the following:



TEST 3.2.2.8

1. Title

P/G and Coupler with H&D Power, Launch Sequence.

2. Objective

To verify compatibility of the P/G and Coupler with the H&D Power Subsystem.

3. Description

3.1 Start up the P/G and Coupler to STRATEGIC ALERT per Test 3.2.2.2.

3.2 Place the Timer Speedup Inhibit switch at the Missile Simulator J-Box to the ON position.

3.3 Activate the SCS switch at the Main Distribution Box to the ARMED position.

3.4 To initiate a Launch, place the Enable A/CO Decoder switch at the Missile Downstage Simulator and Launch Initiator switches to the ON position.

3.5 Repeat paragraph 3.1 thru 3.4.

3.6 Disconnect W548 cable at ACO 112 and verify completion of Launch Sequence.

4. Equipment in Test

Refer to Figure 3.2.2.2-1.

5. Test Equipment Required

NRA Instrumentation System.

6. Data Requirements

Record tapes at 60 ips. Play back at 7.5 ips onto the oscillograph while recording at 1 ips. Permanent records will be made of selected signals.

The tape channels will be connected to the following:

TABLE No. 3.2.2.8-1

Tape Channel No.	Gain	DC/AC	Signal Monitor Point	Signal Characteristics	Osc. Scale V/In.
1			J2-66 J2-65	Enable Launch (Interlock)	
2			J2-6 J5-1 thru	Flight Program Entered	
3			J2-59 J2-60	G&C Umbilical Release	
4			J2-86 J2-87	Ordinance Devices Armed (Except R/V)	
5			J2-85 J2-86	Ordinance Devices Safe (Except R/V)	
6			J4-34 J4-35	G&C System OFF (Monitor)	
7			J2-4 J5-1 thru 4	P/G Timing	
8			J2-29 J2-1 thru 4	Strategic Alert	
9			J1-8 J2-1 thru 4	Launch Sequence in Process	
10			J2-14 J2-1 thru 4	G&C Launch Commanded	
11			J4-25 J4-26	MCU & Electronics Power On	
12			J4-65 J4-66	Activate Missile Batteries	
13				Voice	
14				80 cps Time Code	

TABLE No. 3.2.2.8-1

Tape Channel No.	Gain	DC/AC	Signal Monitor Point	Signal Characteristics	Osc. Scale V/In.
1			J4-28 J4-29	G&C System Power OFF	
2			J4-40 J4-61	Remove Closure	
3			J4-37 J4-38	Arm All Ordnance Devices (Except R/V)	
4			J4-1 J4-2	Critical Leads Disconnect	
5			J4-58 J4-57	Release G&C Umbilical	
6			J4-43 J4-63	Retract G&C Umbilical	
7			J4-68 J4-74	Ignite 1st Stage Engine	
8			J2-30 J5-1 thru 4	Alarm	
9			J2-31 J5-1 thru 4	No-Go	
10				Voice	
11				Time Code 80 cps	
12					
13					
14					

TEST 3.2.2.9

1. Title

P/G and Coupler with H&D Power, Sequence Errors during Strategic Alert.

2. Objective

To verify compatibility of the P/G and Coupler with the H&D Power Subsystem.

3. Description

3.1 Start-up the P/G and Coupler per Test 3.2.2.2 to obtain the Strategic Alert mode.

3.2 Place the Local/Remote switch at the Start-up Unit to Remote.

3.3 Place the Sequence Advance Error switch at the G&C Test Set to the TEST position. When the Disable Discretes True lamp illuminates at the G&C Test Set, place the Sequence Advance Error switch to the Norm position. Place the Program Advance switch at the G&C Test Set ON until the Test in Process lamp at the Start-Up Unit illuminates. When the Calibrate in Process lamp at the Start-up Unit illuminates, place Program Advance ON until Strategic Alert Mode is present.

3.4 Repeat 3.3 for the following Sequence Errors at the G&C Test Set.

(a) Confirm Codes Error

(b) Parity Error

(c) Downstage No-Go

3.5 Repeat 3.4 and verify shutdown on th sequence error.

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TEST 3.2.2.9

1. Title

P/G and Coupler with H&D Power, Sequence Errors during Strategic Alert.

2. Objective

To verify compatibility of the P/G and Coupler with the H&D Power Subsystem.

3. Description

3.1 Start-up the P/G and Coupler per Test 3.2.2.2 to obtain the Strategic Alert mode.

3.2 Place the Local/Remote switch at the Start-up Unit to Remote.

3.3 Place the Sequence Advance Error switch at the G&C Test Set to the TEST position. When the Disable Discretes True lamp illuminates at the G&C Test Set, place the Sequence Advance Error switch to the Norm position. Place the Program Advance switch at the G&C Test Set ON until the Test in Process lamp at the Start-Up Unit illuminates. When the Calibrate in Process lamp at the Start-up Unit illuminates, place Program Advance ON until Strategic Alert Mode is present.

3.4 Repeat 3.3 for the following Sequence Errors at the G&C Test Set.

(a) Confirm Codes Error

(b) Parity Error

(c) Downstage No-Go

3.5 Repeat 3.4 and verify shutdown on th sequence error.

5th

3.6 Start up the P/Q and Coupler to Strategic Alert per Test 3.2.2.2.

3.7 Place the Downstage No-Go switch to the TEST position until Disable Discretes True lamp illuminates, then place to NORM. Verify shut-down of system. Start-up the system to Strategic Alert per Test 3.2.2.2.

3.8 Repeat 3.7 for the following Sequence Errors:

(a) Sequence Advance Error.

(b) Parity Error.

(c) Confirm Codes

3.9 Place the Speed-Up Inhibit switch at the Missile Simulator J-Box to the ON position. Initiate a Test Sequence while in Strategic Alert per Test 3.2.2.4 and place the Downstage No-Go switch to the TEST position. Start-up the system to Strategic Alert.

3.10 Repeat 3.9 for the following Sequence Errors.

(a) Parity Error.

(b) Confirm Codes Error.

3.11 Place the Speedup Inhibit switch to OFF and Start-up the system to Strategic Alert per Test 3.2.2.2. Initiate a Calibrate Command while in Strategic Alert per Test 3.2.2.5 and place the Confirm Codes Error switch to the TEST position until Disable Discretes True lamp illuminates, and immediately place the switch to NORM position. An automatic restart occurs.

3.12 Repeat 3.11 for the following Sequence Errors:

(a) Confirm Codes Error.

(b) Parity Error.

4. Equipment in Test

Refer to Figure 3.2.2.2-1.

5. Test Equipment Required

NRA Instrumentation System.

6. Data Requirements

Record all data in the Test Log.



TEST 3.2.2.10

1. Title

P/G and Coupler with H&D Power, Pre-Flight Mode Alarms, No-Go's and Sequence Errors

2. Objectives

To verify compatibility of the P/G and Coupler with the H&D Power Subsystem.

3. Description

3.1 Start up the system to STRATEGIC ALERT per Test 3.2.2.2 for each test.

3.2 Initiate an Alarm per Test 3.2.2.3 and perform a Launch sequence per Test 3.2.2.3. See results in Table 3.2.2.10-1. Remove Alarm and start up the system to STRATEGIC ALERT. Repeat test for each Alarm indicate in Table 3.2.2.10-1.

3.3 Perform 3.1 and 3.2 for No-Go's per Test 3.2.2.3.

3.4 Perform 3.1 and 3.2 for Sequence Errors per Test 3.2.2.9.

4. Equipment In Test

Refer to Figures 3.2.2.1-1 and 3.2.2.1-2,

5. Test Equipment Required

NRA Instrumentation

6. Data Requirements

Record all data in the test Log.

Table 3.2.2.10-1

Fault	Result
Primary Power Alarm Launch Tube Flood Alarm Equipment Inlet Air Humidity Alarm Launcher Temperature Alarm Equipment Inlet Air Temperature and Flow Alarm Seismic Alarm Autocollimator Alarm Gdc Compartment Temperature Alarm Ordnance Devices Safe Inhibit W/H No-Go R/V Arming & Firing No-Go Unlithical Release Inhibit (at Missile Downstage Simulator)	<div style="display: flex; align-items: center; justify-content: center;"> <div style="text-align: center; flex: 1;"> <p>Launch completed.</p> </div> <div style="flex: 1; text-align: center;"> <p>↔</p> </div> <div style="text-align: center; flex: 1;"> <p>Launch completed. No-Go Shut-down No-Go Shut-down No-Go Shut-down Launch completed.</p> </div> </div>

TABLE 3.2.2.10-1

<u>Fault</u>	<u>Result</u>
Arm Ordnance Devices Inhibit (before launch initiation at Missile Downstage Simulator)	No-Go Shut-down within 30 seconds
Sequence Advance Error	No-Go Shut-down.
Confirm Codes Error	No-Go Shut-down.
Parity Error	No-Go Shut-down.
Downstage No-Go	No-Go Shut-down.

TEST 3.2.2.11

1. Title

P/G and Coupler with H&D Power, Post-Flight No-Go's and Sequence Errors.

2. Objectives

To verify compatibility of the P/G and Coupler with the H&D Power Subsystem.

3. Description

3.1 Start up the system to STRATEGIC ALERT per Test 3.2.2.2 for each test.

3.2 Initiate a Launch sequence per Test 3.2.2.8. When the Armed Ordnance Devices lamp at the Missile Downstage Simulator illuminates, activate a No-Go per Test 3.2.2.3. See results in Table 3.2.2.11-1. Remove the No-Go and start up the system to STRATEGIC ALERT. Repeat test for each No-Go indicated in Table 3.2.2.11-1.

3.3 Perform 3.1 and 3.2 for Sequence Errors per Test 3.2.2.9.

4. Equipment In Test

Refer to Figures 3.2.2.1-1 and 3.2.2.1-2.

5. Test Equipment Required

MRA Instrumentation

6. Data Required

Record all data in the Test Log.

Table 3.2.2.11-1

Event	Result
Ordnance Devices Safe Inhibit W/H No-Go R/V Arming and Fusing No-Go CAC Compartment Temperature No-Go Arm Ordnance Devices Inhibit at Missile Downstage Simulator P/G Shut-down Sequence Advance Error Confirm Codes Parity Error Downstage No-Go	Launch completed ↕ Launch completed. No-Go Shut-down No-Go Shut-down Launch completed → Launch completed



TEST 3.2.2.12

1. Title

P/G and Coupler with H&D Power, Command Interactions.

2. Objectives

To verify compatibility of the P/G and Coupler with the H&D Power Subsystem.

3. Description

3.1 Startup the system to STRATEGIC ALERT per Test 3.2.2.2.

3.2 Initiate a Launch sequence per 3.2.2.8 and then initiate a Test Command per 3.2.2.4. See results in Table 3.2.2.12-1.

After test, Start-up the system to STRATEGIC ALERT.

3.3 Perform 3.2 for Calibrate Command per Test 3.2.2.5.

3.4 Place the system into the ALIGNMENT MODE from STRATEGIC ALERT by activating a Sequence Error, per Test 3.2.2.9. Initiate a Launch and compare the results with Table 3.2.2.12-1.

3.5 Initiate a Test Command from STRATEGIC ALERT immediately followed by a Launch command. See results per Table 3.2.2.12-1.

3.6 Perform 3.5 for Calibrate Command.

3.7 Initiate a Launch from STRATEGIC ALERT with the SCS in the SAFE position.

4. Equipment In Test

See Figures 3.2.2.1-1 and 3.2.2.1-2.

5. Test Equipment Required

NRA Instrumentation

6. Data Requirements

Record all data in the Test Log.

Table 3.2.2.12-1

<u>Command</u>	<u>Mode</u>	<u>Result</u>
Test (3.2)	Flight	System not affected, Launch continues.
Calibrate (3.3)	Flight	System not affected, Launch continues.
Launch (3.4)	Alignment from Strategic Alert	System not affected, Automatic Startup continues
Launch (3.5)	Test from Strategic Alert.	After transferring to Emergency Power, the system enters the Launch Mode.
Launch (3.6)	Calibrate from Strategic Alert.	System not affected, Launch continues.
Launch (3.7)	Strategic Alert with SCS in Safe position.	System not affected.

TEST 3.2.2.13

1. Title

P/G and Coupler with H&D Power, Site Shut-down.

2. Objectives

To verify compatibility of the P/G and Coupler with H&D Power Subsystem.

3. Description

3.1 Place the Remote/Local switch at the Startup Unit to Local.

3.2 Depress the Shut-down Site button at the Startup Unit.

3.3 Open the breakers to P/G and Coupler at the AC Switch panel.

3.4 Open breakers at LF Power Group.

3.5 Open Ordnance Power breakers at the DC Switch panel.

3.6 Turn off power switches at the Startup Unit, LF Interface Simulator,

Missile Downstage Simulator, Launcher Auxiliary Simulator and G&C

Test Set.

4. Equipment in Test

Refer to Figures 3.2.2.2-1 and 3.2.2.2-2.

5. Test Equipment Required

NRA Instrumentation

6. Data Requirements

Record all data in the Test Log.

TEST 3.2.2.14

1. Title

P/G and Coupler with H&D Power, Emergency Power.

2. Objectives

To verify compatibility of the P/G and Coupler with the H&D Power Subsystem.

3. Description

3.1 Place the system into STRATEGIC ALERT per Test 3.2.2.2.

3.2 Open the 60 cycle breakers to the LF M-G Set.

3.3 Initiate a Calibrate Sequence per Test 3.2.2.5.

3.4 Initiate a Launch Sequence per Test 3.2.2.8.

4. Equipment in Test

Refer to Figures 3.2.2.2-1 and 3.2.2.2-2.

5. Test Equipment Required

HRA Instrumentation System

6. Data Requirements

Refer to Tests 3.2.2.5 and 3.2.2.8.

TEST 3.2.4.1

1. Title

LF site startup on H&D Power

2. Objective

To establish a turn-on procedure for the LF when using H&D Power.

3. Description

3.1 Connect the equipment per Figure 3.2.4.1-1

3.2 Open the breakers to the P/G and G&C Coupler at the AC Switch Panel

3.3 Place all switches on the Launcher Auxiliary Simulator, Missile Simulator, Startup Unit and G&C Coupler Test-set to the OFF or NORMAL position.

3.4 Verify that the P/G ON LF POWER GROUP and COUPLER ON POWER GROUP lamps at the AC Switch Panel and on.

3.5 Verify that the COOLING SAFE lamp is on.

3.6 Verify that the MAIN POWER CONTROL lamp at the AC Switch Panel is on.
If necessary, press RESET button. If the cooling was off, it may be necessary to first press the RESET button on the Cooling Safe Unit.

3.7 Verify that the EMERGENCY POWER TEST lamp on the AC Switch Panel is off.
If on, manually reset relay K6 in the AC Switch Panel.

CAUTION: Dangerous voltages are present in the proximity
of this relay.

3.8 The POWER TEST lamp on the AC Switch Panel should be off.

3.9 Close the breakers at the LF Power Group

3.10 Close the breaker at Rack 402



Test 3.2.4.1 (cont.)

- 3.11 Close the breaker at Rack 401
- 3.12 Place the Startup Unit DISABLE DISCRETES TRUE and HALT DRIVE Switches on.
- 3.13 Close breakers CB1 to the P/G and CD2 to the G&C Coupler at the AC Switch Panel. Verify that the indicators for each phase are on. Monitor Power On lamp shall light.
- 3.14 Turn on Ordnance Power at the AC Switch Panel.
- 3.15 Turn on the POWER switch at the Startup Unit.
- 3.16 Place the Missile Simulator POWER switch on.
- 3.17 Place the REMOTE/LOCAL switch to LOCAL at the Startup Unit.
- 3.18 Place the G&C Coupler Test Set Power switch on. If malfunction lamps are on, depress the MALFUNCTION RESET.
- 3.19 Depress the SHUT DOWN SITE button at the P/G. The NO-GO lamp on the Startup Unit shall illuminate.
- 3.20 Depress the NO-GO RESET button at the P/G. The NO-GO lamp on the Startup Unit shall go out.
- 3.21 Test Complete.

4. Equipment In Test

Refer to Figure 3.2.4.1-1

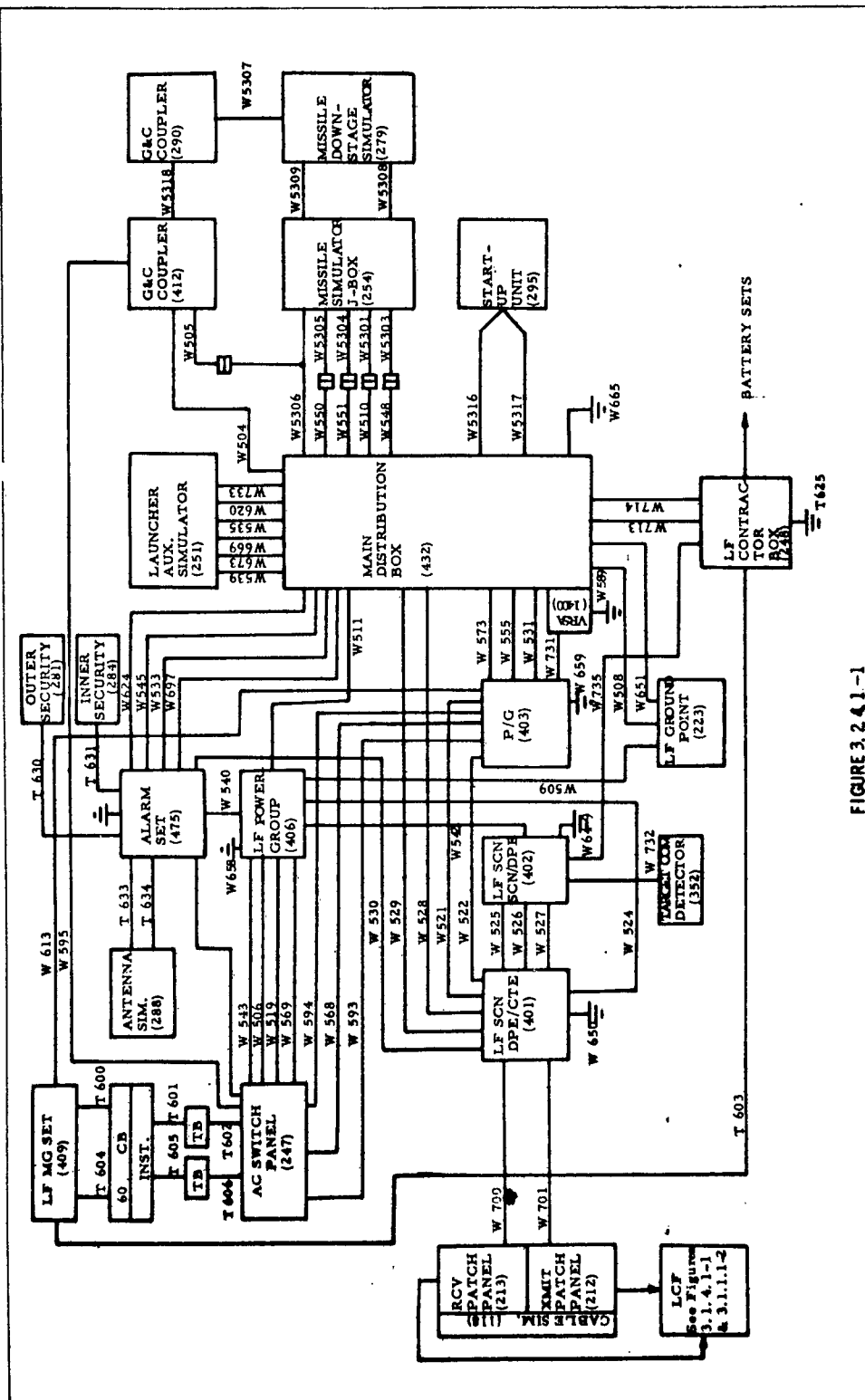
5. Test Equipment In Test

None

6. Data Requirements

6.1 Record all observations in the M&IR Test Log.





TEST 3.2.4.2

1. Title

LF Transfer to Emergency Power

2. Objective

To determine the load characteristics of the LF operational equipment plus dummy loads to simulate complete loading of the LF H&D power subsystem.

3. Description

3.1 Connect the equipment per Figure 3.2.4.1-1

3.2 Startup the system per Test 3.2.4.1

3.3 Monitor the power system transients, frequency, noise and ripple during startup and operation.

3.4 Initiate a 60 cycle primary power failure to the LF MG set to obtain a transfer to Emergency Power.

3.5 Monitor the power system transients, frequency, noise and ripple during transfer to Emergency Power.

3.6 Remove the 60 cycle primary power fault to obtain a transfer to primary power from Emergency Power.

4. Equipment In Test.

4.1 See Figure 3.2.4.1-1

5. Test Equipment

5.1 NRA Instrumentation

5.2 Oscilloscope, Tektronix 545A

5.3 Plug-In-Unit, Tektronix Type CA

5.4 Frequency Discriminator, Figure 3.1.1.1-3

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Test 3.2.4.2 (cont.)

5.5 Differential Voltmeter, Fluke 803

5.6 LCF Instrumentation Assemble.

6. Data Requirements

6.1 All tape recorded signals are referenced to 300 mcm ground bus.

Record tape at 60 ips and play back at 7.5 ips. Record all data observed in the M&IR Test Log.



TEST 3.2.4.3

1. Title

LF Operation on H&D Power, Strategic Alert

2. Objective

To determine the loading characteristics of the LF operational equipment plus dummy loads to simulate complete loading of the LF H&D power subsystem during LF operation.

3. Description

3.1 Connect the equipment per Figure 3.2.4.1-1

3.2 Startup the system per Test 3.2.4.1

3.3 Place the system into Strategic Alert per Test 3.2.2.2

3.4 Monitor the power system transients, frequency, noise and ripple during system operations

3.5 Verify that the Strategic Alert indicator lamp at the LCC is illuminated.

3.6 Monitor status messages to the LCF at the patch panel.

4. Equipment In Test

See Figure 3.2.4.1-1

5. Test Equipment

5.1 NRA Instrumentation System

5.2 Oscilloscope, Tektronix 545A

5.3 Plug-In-Unit, Tektronix Type CA

5.4 Frequency Discriminator, Figure 3.1.1.1-3

5.5 Differential Voltmeter, Fluke 803

5.6 LF Instrumentation Assembly

Test 3.2.4.3 (cont.)

6. Data Requirements

- 6.1 Record tape at 60 ips and play back at 7.5 ips. Record all data observed in the M&IR Test Log.

TEST 3.2.4.4

1. Title

LF Operation on H&D Power. Test while in strategic alert mode.

2. Objectives

To determine the loading characteristics of the LF operational equipment plus dummy loads to simulate complete loading of the LF H&D power subsystem during LF operation.

3. Description

3.1 Connect the equipment per Figure 3.2.4.1-1

3.2 Startup the system per Test 3.2.4.1

3.3 Place the system into strategic alert per Test 3.2.2.2

3.4 Issue a Test command from the LCC.

3.5 Monitor the power system transients, frequency, noise and ripple during system operation.

3.6 Verify that the strategic alert lamp at the LCC goes off during the test sequence and comes on after test completion.

3.7 Verify that the standby and traffic on net lamps illuminate at the LCC during the test sequence.

3.8 Monitor status messages from the LF at the patch panel.

3.9 Monitor P/G interface signals per Test 3.2.2.4

4. Equipment In Test

4.1 See Figure 3.2.4.1-1

5. Test Equipment

5.1 NRA Instrumentation System

Test 3.2.4.4 (cont.)

5.2 Oscilloscope, Tektronix 545A

5.3 Plug-In-Unit, Tektronix Type CA

5.4 Frequency Discriminator, Figure 3.1.1.1-3

5.5 Differential Voltmeter, Fluke 803

5.6 LF Instrumentation Assembly

6. Data Requirements

6.1 All tape recorded signals are referenced to 300 mcm ground bus.

Record tape at 60 ips. and play back at 7.5 ips. Record all
data observed in the W&IR Test Log.

TEST 3.2.2.5

1. Title

LF Operation on H&D Power, Calibrate while in Strategic Alert Mode.

2. Objectives

To determine the loading characteristics of the LF operational equipment plus dummy loads to simulate complete loading of the LF H&D power subsystem during LF Operation.

3. Description

3.1 Connect the equipment per Figure 3.2.4.1-1

3.2 Startup the system per Test 3.2.4.1

3.3 Place the system into Strategic Alert per Test 3.2.2.2

3.4 Issue a Calibrate Command from the LCC.

3.5 Monitor the power system transients, frequency, noise and ripple during system operation.

3.6 Verify that the Strategic Alert lamp at the LCC goes off during the calibrate sequence and comes on after calibration completion.

3.7 Verify that the Standby and Traffic On Net lamps illuminate at the LCC during the calibrate sequence.

3.8 Monitor status messages for m the LF at the patch panel.

3.9 Monitor P/G interface signals per Test 3.2.2.5

4. Equipment In Test

4.1 See Figure 3.2.4.1-1

5. Test Equipment

5.1 NRA Instrumentation System

5.2 Oscilloscope, Tektronix 545A

5.3 Plug-In-Unit, Tektronix Type QA

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5.4 Frequency Discriminator, Figure 3.1.1.1-3

5.5 Differential Voltmeter, Fluke 803

5.6 LF Instrumentation Assembly

6. Data Requirements

6.1 Record tape at 60 ips and playback at 7.5 ips. Record all data observed in the MEIR Test Log.

TEST 3.2.4.6

1. Title

LF Operation on H&D Power, Launch Sequence

2. Objectives

To determine the loading characteristics of the LF operational equipment plus dummy loads to simulate complete loading of the LF H&D power subsystem during LF operation

3. Description

3.1 Connect the equipment per Figure 3.2.4.1-1

3.2 Startup the system per Test 3.2.4.1

3.3 Place the system into Strategic Alert per Test 3.2.2.2

3.4 Monitor the power system transients, frequency, noise and ripple, during system operations.

3.5 Place the SCS switch to the armed position. Verify that the armed lamp illuminates at the LCC.

3.6 Initiate a Launch sequence from the LCP. Verify that Launch Commanded lamp illuminates at the LCC.

3.7 Verify that Standby, Traffic on Net and Launch In Process lamp illuminates at the LCC.

Monitor status messages from the LF at the patch Panel.

3.8 Monitor P/G interface signals per Test 3.2.2.8

4. Equipment In Test

4.1 See Figure 3.2.4.1-1

5. Test Equipment

- 5.1 NRA Instrumentation System
- 5.2 Oscilloscope, Tektronix 545A
- 5.3 Plug-In-Unit, Tektronix Type CA
- 5.4 Frequency Discriminator, Figure 3.1.1.1-3
- 5.5 Differential Voltmeter, Fluke 803
- 5.6 LF Instrumentation system

6. Data Requirements

- 6.1 Record tape at 60 ips and playback at 7.5 ips. Record all data observed in the M&IR Test Log

TEST 3.2.4.7

1. Title

LF Operation on Emergency Power

2. Objectives

- 3.1 Connect the equipment per Figure 3.2.4.1-1
- 3.2 Startup the system per Test 3.2.4.1
- 3.3 Place the system into Strategic Alert per Test 3.2.2.2
- 3.4 Place the system on Emergency Power per Test 3.2.4.1
- 3.5 Monitor the power system transients, frequency, noise and ripple during system operations
- 3.6 Initiate a Test sequence per Test 3.2.4.4
- 3.7 Monitor status signals from the LF at the patch panel and record P/G interface signals per Test 3.2.2.4
- 3.8 Initiate a Calibrate sequence per Test 3.2.4.5
- 3.9 Monitor status signals from the LF at the patch panel and record P/G interface signals per Test 3.2.2.4
- 3.10 Initiate a Launch sequence per Test 3.2.4.6
- 3.11 Monitor status signals from the LF at the patch panel and record P/G interface signals per Test 3.2.2.8
- 3.12 Operate functions of the LF in order to determine maximum loading conditions.

4. Equipment In Test

See Figure 3.2.4.1-1

5. Test Equipment

- 5.1 NRA Instrumentation system
- 5.2 Oscilloscope, Tektronix 545A



5.3 Plug-In-Unit Tektronix Type CA

5.4 Frequency Discriminator, Figure 3.1.1.1-3

5.5 Differential Voltmeter, Fluke 803

5.6 LF Instrumentation system

6. Data Requirements

6.1 Record tapes at 60 ips and palyback at 7.5 ips. Record all data observed in the M&IR Test Log.

